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# ECONOMIC RELATIONS WITH THE SOVIET UNION

# HEARINGS

BEFORE THE

SUBCOMMITTEE ON
INTERNATIONAL ECONOMIC POLICY

AND THE

COMMITTEE ON FOREIGN RELATIONS
UNITED STATES SENATE

NINETY-SEVENTH CONGRESS

SECOND SESSION

JULY 30, 1982—THE IMPLICATIONS OF U.S. EXPORT CONTROLS RELATED TO THE SOVIET GAS PIPELINE (SUBCOMMITTEE ON INTERNATIONAL ECONOMIC POLICY)
AUGUST 12 AND 13, 1982—ECONOMIC POLICY TOWARD THE SOVIET UNION (COMMITTEE ON FOREIGN RELATIONS)

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# ECONOMIC RELATIONS WITH THE SOVIET UNION

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## FRIDAY, JULY 30, 1982

United States Senate,
Subcommittee on International Economic Policy,
Committee on Foreign Relations,
*Washington, D.C.*

The subcommittee met, pursuant to notice, at 10 a.m., in room 4221, Dirksen Senate Office Building, Hon. Charles McC. Mathias (chairman of the subcommittee) presiding.

Present: Senators Mathias, Percy, Helms, and Pell.

Senator Mathias. The subcommittee will come to order.

This morning the Subcommittee on International Economic Policy meets to examine the impact upon American interests of the administration's most recent actions with respect to the Soviet-Western Europe natural gas pipeline, the imposition of extraterritorial retroactive sanctions.

This hearing is a followup to one held by the subcommittee on March 3, 1982, on the subject of the position the United States should adopt with respect to the pipeline. At that time the question was whether or not the United States should attempt to extend its legal reach inside foreign jurisdictions for the purpose of stopping or delaying construction of the pipeline.

On June 18, President Reagan expressed himself on that question. He expanded the ban on U.S. sales of equipment for the pipeline to include overseas subsidiaries of American firms and information firms using U.S. licenses to produce equipment for the pipeline.

Now, our closest friends and allies have also expressed themselves on the question, and they have raised strenuous objections to the unilateral embargo that the administration has imposed.

Otto Graf Lambsdorff, Minister of Economics of the Federal Republic of Germany, stated the sentiments of many West Europeans in his recent Washington Post editorial statement when he said that the application of the principle of extraterritoriality in U.S. Government decisions is unacceptable to us. It violates our sovereignty. Therefore we have to reject it.

Today we offer an opportunity to those who think the sanction is good policy to persuade the committee that the pain is worth it. We need an objective assessment of exactly whose ox is being gored, or perhaps it might be accurate to say which ox is bleeding the most, and this hearing is intended to contribute to that effort.

We all recognize that the pursuit of a strategic foreign policy often and perhaps usually, involves choosing between conflicting imperatives. Foreign policy issues are very rarely clearcut, and it is the essence of leadership, statesmanship, if you like, to make the choices.

We must, therefore, take seriously administration concern over the continuing military suppression in Poland. Similarly, we are all apprehensive about any increased Western European dependence on Soviet energy sources and about the hard currency cash flow that the sale of this gas will bring into the Soviet treasury.

But I think we need to be convinced that this embargo, either alone or in conjunction with other measures, will affect Soviet behavior positively, or that it will result in improvements in Poland, or that it will materially impede the construction of the pipeline. I think these two are serious questions because the administration's actions have very serious negative implications which have to be weighed in the balance. We do not want to find a year from now that we have simply been engaged in a fruitless exercise of what might be called "feel good" policy, "feel good" being that we have done something which gives us a temporary psychic relief, only to discover later that the side effects have been disastrous.

Western European leaders are adamantly opposed to our actions and in some cases have ordered businesses in their countries to disregard our injunctions. Furthermore, this issue cannot be taken in isolation. It has to be set against a background of existing fissures within the Western alliance over nuclear, economic, and political issues.

We have, for example, serious differences with our European friends over steel, interest rates, and agricultural policy. So the question becomes how much more negative traffic can the alliance bear? Are we not, in fact, hurting ourselves more than we are hurting the Soviet Union?

The second panel that will be heard this morning will address itself to the last question, seeking to gage the impact of the administration's decisions on American business and on the ability of the Europeans and the Soviets to complete the pipeline despite our actions.

As a nation we have tried embargoes a number of times, beginning with the Non-Intercourse Act of 1774, enacted by the Association of American Colonies against Great Britain, and as we recall, that action led to war.

As history records, an embargo has often been a prelude to war, which lends some weight to President Mitterand's argument that an embargo is an act of economic warfare and should be invoked only when a nation is prepared to proceed to military hostilities.

Now, I do not believe that that is President Reagan's intention, but we are moving in unchartered waters. We are attempting to hurt the Soviet Union but without making it clear exactly what we expect from Moscow. And we are, as is so often the case, operating without a clearly enunciated strategy. In the process we are inflicting pain on ourselves and pain on our friends.

The question thus occurs which has been frequently asked and seldom answered, which nation does an embargo damage the most, the embargoer or the embargoee?

I hope today we can get a clearer appreciation of what the level of pain will be and whether or not it will be worth it.

We are privileged this morning to have as our first panel the Honorable James L. Buckley, Under Secretary of State for Security Assistance, Science and Technology; and the Honorable Lionel Olmer, Under Secretary of Commerce.

I see the chairman of the full committee has arrived, and before we ask the panel to start, let me ask the chairman if he wants to say anything at the outset.

The CHAIRMAN. I would.

As you know, Mr. Chairman, I feel strongly about this issue, and that is no surprise to our distinguished witnesses.

First I would like to commend you for calling this hearing today to thoroughly appraise the administration's sanctions against the Soviet Union. I think they are timely coming as they do at the halfway point in the administration's comment period on the sanctions. That comment period ends on August 21, as I recall.

Certainly we hope to throw light on the purposes and impact of this policy. That may in turn cause the administration to modify the policy on specific regulations.

The sanctions imposed by the President in December and extended in June go well beyond the construction of the Yamal pipeline. There seems to be some misunderstanding about this, as the sanctions are also often referred to as the pipeline sanctions. Grain drying equipment and machine tool cutting machines have virtually nothing to do with the Yamal pipeline. The headlines blared the other day that Rockford, Ill., the home of machine tool building, has the second highest unemployment in the Nation. I recently reminded the President that I was just a few miles from his home there, with 24 percent unemployment in the city of Rockford.

For that matter, Caterpillar pipelayers and the Fiat-Allis crawler tractors that have also wound up in these sanctions, have nothing to do with the pipeline.

I hope we will get some clarification today from the administration about the true intent of these sanctions.

Mr. Chairman, I would like to point out to you, the committee, and our witnesses that approximately 75 percent of the products affected by the sanctions are manufactured in Illinois. Moreover, the same products, without exception, are also available elsewhere in the world. Pipelayers are available from Japan, grain drying equipment from Denmark and Holland, and crawler tractors from other manufacturers in Europe and Japan. The sanctions will not impose a cost on the Soviets in these cases, they will simply lose the business for U.S. companies and workers.

The Caterpillar Tractor Co., has recently compiled a useful list of its subcontractors that have been, in turn, affected by these sanctions. These small companies are located all over the country, from Pennsylvania to Wyoming, and I could give the list of these companies.

I would like to place in the hearing record the chart provided to me by Caterpillar to emphasize the pervasiveness of the sanctions. Individual subcontracts of as much as $2 million, and as small as $3,000, have been lost. Innumerable jobs have been lost in these small businesses, and one plant in Louisiana even closed down entirely. Caterpillar has been faced with tens of thousands of dollars of cancellation charges paid to these subcontractors because of Government sanctions.

[The information referred to follows:]

Following is information relative to suppliers who were injured or seriously impacted by cancellation of the contract.

### CANCELLATION OF SOVIET PIPE LAYING CONTRACT

| Location of supplier and commodity | Lost revenue | Employees affected thru layoffs |
|---|---|---|
| Purchased finished—suppliers: | | |
| Plymouth, Mich.: General machining | $10,620 | 2 |
| East Peoria, Ill.: General machining | 5,263 | 1 |
| Chillicothe, Ill.: Weldments | 43,023 | 3 |
| Peoria, Ill.: Weldments | 200,720 | [1] 15 |
| Davenport, Iowa.: Weldments | 65,425 | [2] 2,600 |
| Goodfield, Ill.: Weldments | 106,868 | [3] 800 |
| Chillicothe, Ill.: Weldments | 655,595 | 10 |
| Morton, Ill.: Weldments | 33,709 | 2 |
| Chicago, Ill.: Weldments | 26,000 | [4] 2 |
| Warren, Mich.: Weldments | 237,007 | [5] 7 |
| Casper, Wyo.: Weldments | 2,117,978 | 64 |
| Metamora, Ill.: Weldments | 99,556 | 7 |
| Chicago, Ill.: Weldments | 2,000,000 | 33 |
| Gurley, Nebr.: Weldments | 12,436 | 1 |

[1] For 15 weeks.
[2] Hours lost.
[3] Hours lost over 6 mo.
[4] For 7 weeks.
[5] 4-day work week also.

### CANCELLATION CHARGES RECEIVED FROM THE FOLLOWING PURCHASED FINISHED SUPPLIERS

| Location of supplier and commodity | Pending | Paid |
|---|---|---|
| Plymouth, Mich.: General machining | $7,461 | |
| East Peoria, Ill.: General machining | | $4,040 |
| Casper, Wyo.: Weldments | 300,943 | |
| South Bend, Ind.: Weldments | | 13,377 |
| Davenport, Iowa: Weldments | | 2,641 |
| Cassville, Mo.: Weldments | | 5,626 |
| Fargo, N. Dak.: Weldments | | 7,544 |
| Independence, Mo.: Weldments | | 2,719 |

| Location of supplier and commodity | Lost revenue | Employees affected thru layoffs |
|---|---|---|
| Casting and forging suppliers: | | |
| Cudahy, Wis.: Forgings | $474,410 | 15 |
| Jackson, Mich.: Forgings | 73,773 | |
| Chicago, Ill.: Forgings | 104,989 | |
| Warsaw, Ind.: Castings | 3,183 | |
| Filer City, Mich.: Forgings | 8,933 | |
| Chicago, Ill.: Forgings | 28,698 | |
| Bethleham, Pa.: Forgings | 134,162 | |
| Milwaukee, Wis.: Forgings | 4,157 | |
| New Kensington, Pa.: Forgings | 8,845 | |

Following casting suppliers produced material but not allowed to ship. This may result in cancellation charges.

| Location of supplier: | *Value of castings* |
|---|---|
| Milwaukee, Wis | $48,308 |
| Keokuk, Iowa | 26,486 |
| Alton, Ill | 23,125 |
| Bettendorf, Iowa | 9,818 |
| Milwaukee, Wis | 2,790 |
| Muskegon, Mich | 18,081 |
| Bridgeton, Mo | 7,034 |
| Racine, Wis | 10,463 |
| Shreveport, La. (Paid cancellation charge of $193,424. Plant closed due to lack of work) | |

The **Chairman**. In summary, then, we are looking to the witnesses today to shed light on why we are pursuing this course. Wisely, we have not enbargoed grain as we did several years ago. We learned the hard way the futility of that route. President Reagan agreed that this embargo, without the cooperation of our allies, was futile. Last March, for example, in his grain export policy statement, the President said he would not hesitate to "declare an embargo if it were part of a complete boycott and if we could have the cooperation of other nations so that we wouldn't end up hurting ourselves with no harm done to those who we are trying to influence."

Moreover, the President said that "in the past 8 years, our stop and go export actions have weakened our reputation as a reliable supplier." He also added, that "the bottom line is that the Soviet embargo was bad for our farmers, bad for our economy, but not that bad for the aggressors we were supposedly going to punish."

Now we seem to be learning that these same principles enunciated by the President with regard to the grain embargo also apply to the embargo of manufactured goods. I hope our witnesses will tell us why we should not apply these same standards here as we are correctly doing in the case of grain.

We are taking the administration's comment period on this sanctions very seriously. The full Foreign Relations Committee will look further into this on August 12 and 13. On these days I will chair the hearings on the impact of these sanctions and other policies to bring economic pressure on the Soviet Union, on our businesses and economy, and on our allies. The June sanctions are almost unprecedented in nature and we will be taking a close and serious look at them.

And I thank you once again, Mr. Chairman, for holding this particular hearing at this particular time.

Senator **Mathias**. Thank you, Mr. Chairman.

Gentlemen, you have your charge, shed light.

The **Chairman**. We assure you we have open minds on this issue. [General laughter.]

Mr. **Olmer**. I never had a moment's doubt, Senator Percy.

Senator **Mathias**. I want to tell Mr. Olmer that unless there is a vote on the floor, which could occur, I will not walk out on him this morning, regardless of what he says.

Mr. Chairman, I am pleased to have this opportunity to testify on many of the issues raised by President Reagan's decision of June 18, 1982 to amend the existing foreign policy controls to cover oil and gas equipment produced abroad by U.S. subsidiaries or licensees.

I have a statement I would like to introduce for the record, and would propose to briefly summarize it now.

Senator MATHIAS. Without objection, the statement will be included in the record.

Mr. OLMER. On June 22, the Department issued regulations to implement the President's decisions, and those regulations were issued in interim form. However, they are effective immediately, though they will not be issued in final form until after the public comment period which ends on August 21, 1982.

The President's decision was based on continued repression in Poland and the complicity of the Soviet Government in that situation. There were three conditions set forth by the President under which he might have reconsidered the earlier imposed sanctions, and it is important to note that the conditions were unanimously endorsed at a NATO Ministers' meeting on January 11, 1982. These are: the release of political prisoners, the ending of martial law, and the resumption of a dialog between Solidarity, the government and the church.

Until recently, matters seemed to be getting worse, not better. The steps announced by Marshal Jaruzelski last week are encouraging but do not go far enough. We are watching these developments very closely, and on behalf of the Polish people, hope for further improvements.

Many groups have spoken out in defense of Poland's rights under the Helsinki Agreement. The AFL-CIO and the International Confederation of Free Trade Unions have called upon the President to take even stronger action. They remain concerned about the suppression of the Polish labor movement, and they have been supportive of the sanctions that he announed.

I would like to turn briefly to the legal, commercial and security implications of these new foreign policy controls. Since 1978, the United States has maintained some degree of control on exports to Russia of equipment and technology for oil and gas exploration and production. In December of last year they were expanded to encompass equipment and technology for the refinement and transmission of oil and gas.

The Export Administration Act provides broad authority to control exports from foreign countries where the exporter is "a person subject to the jurisdiction of the United States." Congress expressly included U.S. controlled foreign firms within that meaning of jurisdiction.

The June controls define the term "persons subject to the jurisdiction of the United States, to include foreign firms which are owned or controlled by U.S. persons."

Over the years there have been similar assertions of jurisidiction by our Government. The Export Administration Act of 1979 also gives to the President broad authority to control the export of any goods of technology subject to the jurisdiction of the United States. That authority has been exercised for many years to control three types of foreign transactions: No. 1, exports and reexports of U.S.

goods and technology; two, exports and re-exports of foreign end products which incorporate U.S. parts; and three, exports and re-exports of foreign products of U.S. technology.

Congress specifically approved the use of re-export controls during its 1979 consideration of the Export Administration Act. The Senate committee report and a House floor amendment dealing with control of re-exports testify eloquently to that understanding.

Congress need hardly be reminded of another area in which it concluded that the importance of U.S. interests warrant an extraterritorial extension of jurisdiction. I refer to the antiboycott law, the effective enforcement of which by this administration is no less intense or, I might add, potentially laden with conflict than are the controls over goods and technology destined for Communist regimes.

With the expanded controls of June 22, the export to the U.S.S.R. of foreign products of U.S. oil and gas technology, will be subject to the controls in effect at the time of export from the foreign country. That is why we reject the characterization of retroactivity.

Mr. Chairman, we have the legal authority to carry out the President's policy, and we are prepared to enforce the controls to the extent necessary. Although criminal sanctions are provided for in the Export Administration Act, we realize that there can and probably will be special jurisdictional obstacles to the successful criminal prosecution and violations occurring abroad.

Administrative sanctions, however, do provide effective enforcement measures. For example, the denial to foreign firms of the privilege of participating in any transaction that involves goods or technology exported from the United States is a very powerful deterrent.

We are prepared to take appropriate enforcement measures in the event of a violation or of an impending violation. Foreign government pronouncements and press accounts notwithstanding, it is far from clear at this point that any firm is prepared to defy the controls.

The jurisdictional reach of these controls is not unique. Throughout the long history of the U.S. export control program, goods and technology have been subjected to restrictions on their re-export or on their use abroad.

The Department of Commerce, as you know, has the responsibility for assessing the implications for American business of U.S. foreign policy controls on energy equipment and technology sales by U.S. industry. We have made the following estimates of the impact of these sanctions on U.S. and foreign business.

Over the next 3 years, the United States will probably lose between $300 million and $600 million in exports, direct and through third countries. Over the next 3 years, foreign subsidiaries as well as technology licensees of U.S. firms, could lose as much as $1.6 billion in business with the Soviet Union.

The U.S.S.R.'s plan to build over 12,000 miles of large-diameter natural gas pipeline over the next 5 years, including the export line to Western Europe, represents one of the most ambitious and strategically significant undertakings in Soviet energy development. It is prompted by the reality that sometime in the 1980's oil production in the U.S.S.R. will probably peak or even decline, thereby leaving the Soviets to choose between reducing supplies to Eastern Europe or foregoing revenues which contribute approximately 60 percent of annual hard currency earnings.

Energy is already projected to absorb over 50 percent of the annual capital investment increment in the 1980 to 1985 period, and this share cannot easily be increased without reducing the Soviet allocation to the consumer sector or to the military.

Perhaps more disturbingly, reliance by Eastern Europe on free world imported oil would introduce new inflationary pressures on economies which are already overburdened. They will have great difficulty paying for oil imports from free world sources if that is necessary.

There can be little doubt that Soviet planners would prefer to avoid such an outcome. In their minds, the optimal solution is to convince the West to furnish to the Soviet energy industry billions of dollars of the most up-to-date and reliable equipment, generously subsidized at below market rates, in return for promises to repay these credits with deliveries of natural gas.

The sanctions imposed by President Reagan offer the West a period to reflect on these issues. What we need more is to lower the rhetoric and to contemplate carefully our longer term strategic interests.

I would like to comment very briefly on the general issue of whether sanctions and national security export controls make a difference.

In some cases it can appear that the immediate, tangible cost to the exporting country in terms of sales foregone and higher unemployment do outweigh the intangible future gains from the actions. But even though intangibles are by definition hard to estimate, we should make no mistake as to the net benefit of these sanctions to the United States and to the Western alliance.

Our national security export control system serves a protective function by enabling the West to preserve its lead over the U.S.S.R. in technology relevant to military purposes. The control system is admittedly cumbersome and sometimes inefficient, but it works. It would be extremely shortsighted, in my view, to argue that the system should be taken away, or that mutual security would be enhanced by an unimpeded flow of technology from West to East. The immediate financial benefits accruing to individual companies, in my judgment, would be far outweighed by the future costs to be borne by society as a whole.

Some would assert that bloc countries have now achieved technological parity with the United States and thus our control system is obsolete and should be scrapped. That is patent nonsense. Previous laxness in the administration of controls or less than total effectiveness should not be used as a rationale for future irresponsibility.

Perhaps most important, as evidence of the effectiveness of our controls, is the desperate need of the Soviet bloc countries for imported know-how. Their impressive and expensive efforts to illegally acquire technology through the espionage arm of the Soviet Union itself, or Poland and East Germany, to name a few, have found some excellent fishing in the industrialized democracies. We cannot, of course, prevent them entirely from poaching, but we can substantially raise the cost of the catch, and we are in the process of doing so in this administration.

In conclusion, Mr. Chairman, I would like to stress that we recognize that sanctions are imposing strains on our relationship with the Western alliance and some serious hardships for domestic and international business. But are we to turn our backs on what has happened in Poland? Should we conduct business as usual? Is the sanctity of the business contract more important than a demonstration of our resolve to keep a sharp focus of attention on these terrible events?

The answer is not. And despite the media criticism of our announced sanctions and the strains which we are now experiencing, I happen to think that we are much admired for once again asserting an American leadership role in standing for justice and freedom.

Thank you, sir.

[Mr. Olmer's prepared statement follows:]

### Prepared Statement of Hon. Lionel H. Olmer

Mr. Chairman. I am very pleased to have the opportunity to appear and testify on the issues raised by President Reagan's decision on June 18, 1982, to amend existing foreign policy controls to cover oil and gas equipment produced abroad by U.S. subsidiaries or licensees. On June 22, 1982, the Department of Commerce issued regulations in interim form to implement this decision. The regulations are immediately effective, but they will not be issued in final form until after the public comment period, which ends August 21, 1982.

The President's decision was based on continued repression in Poland and the complicity of the Soviet Government in that situation. he had announced a more limited export control policy in December, stating at that time that if the Polish military junta failed to make measurable progress toward national reconciliation, he would be prepared to take further action.

The three conditions set forth by the President, and it is important to note, unanimously endorsed at the NATO Ministers' meeting on January 11, 1982, have not been met; these are: (1) the release of political prisoners, (2) the ending of martial law, and (3) the resumption of dialogue between solidarity, the Government and the Church. Until very recently, matters seemed to be getting worse, not better. The steps announced by Marshal Jaruzelski last week are encouraging but do not go far enough. We are watching these new developments very closely and on behalf of the Polish people hope for further improvements. In short, we submit the timing is particularly inappropriate for entering into the largest single East-West commercial transaction in history.

Many groups have spoken out in defense of Poland's rights under the Helsinki Agreement. The AFL-CIO and the International Confederation of Free Trade Unions have called upon the President to take even stronger action. They remain concerned about the suppression of the Polish labor movement.

I would now like to turn to the legal, commercial, and security implications of the new foreign policy controls.

#### STATUTORY AUTHORITY AND REGULATIONS

Since 1978, the United States has maintained some degree of control on exports to the U.S.S.R. of equipment and technology for oil and gas exploration and production. In December 1981, the President expanded these controls to encompass equipment and technology for the "refinement" and the "transmission" of oil and gas.

The June 18 decision expanded the existing foreign policy controls to include: (1) foreign origin equipment and technology exported by U.S. owned or controlled foreign firms and (2) foreign products based on U.S. technology subject to a licensing or royalty agreement.

You have asked me to explain the legal basis for the June controls. The Export Administration Act provides broad authority to control exports from foreign countries where the exporter is a "person subject to the jurisdiction of the United

States." Under the Act Congress expressly included U.S.-controlled foreign firms within this jurisdiction. The June controls define the term "persons subject to the jurisdiction of the United States" to include foreign firms "owned or controlled" by U.S. persons. Over the years there have been similar assertions of jurisdiction by our Government in regulations promulgated under the Trading with the Enemy Act and the International Emergency Economic Powers Act, where recently the sanctions against Iran were applied to block Iranian assets held by U.S.-controlled banks abroad.

The Export Administration Act also gives the President broad authority to control the export of any goods or technology "subject to the jurisdiction of the United States." Such authority, based on the U.S. origin of goods or technology, has been exercised for many years to control three types of foreign transactions: (1) exports and reexports of U.S. goods and technology, (2) exports and reexports of foreign end-products incorporating U.S. parts, and (3) exports and reexports of foreign products of U.S. technology. Congress approved the use of reexport controls during its 1979 consideration of the Export Administration Act, though it was clearly aware of the potential conflict with foreign governments that such controls could cause. The Senate committee report and a House floor amendment dealing with control of reexports testify to this understanding.

Congress need hardly be reminded of another area in which it concluded that the importance of U.S. interests warrant an extraterritorial extension of jurisdiction; I refer to the antiboycott law. The effective enforcement of which by the Administration is no less intense or potentially conflict laden than are controls over goods and technology destined for Communist regimes.

The basic point is this: neither the Congress nor the Executive lightly subjects transactions abroad to U.S. rules and the risks of conflict with local law; however, when the necessary links to the United States are present, and sufficiently important U.S. interests are at stake, both the Congress and the Executive have been willing to use an extensive jurisdictional reach. This has been the case whether the concern is to prevent aiding and abetting of the Arab boycott of Israel, a response to the seizure of hostages in Iran, or sanctions against South Africa's racial policies or efforts to deprive Libya of the means for supporting terrorist activities.

With the expanded regulations of June 22, the export to the U.S.S.R. of foreign products of U.S. oil and gas technology will be subject to the controls in effect at the time of export from the foreign country, this is the date which is when controls traditionally exercised over reexports of U.S. origin goods and technology and over exports of foreign products containing U.S. parts take effect.

Mr. Chairman, we have the legal authority to carry out the President's policy, and we are prepared to enforce the controls to the extent necessary. Although criminal sanctions are provided for in the Export Administration Act, we realize that there can be special jurisdictional obstacles to the successful criminal prosecution of violations occurring abroad.

Administrative sanctions, however, do provide effective enforcement measures. For example, the denial to foreign firms of the privilege of participating in any transaction that involves goods or technology exported from the United States is usually a powerful deterrent.

We are prepared to take appropriate enforcement measures in the event of a violation or of an impending violation. Foreign government pronouncements and press accounts notwithstanding, it is far from clear at this point that any firm is prepared to defy the controls.

Other governments have questioned whether it is lawful for the United States to apply these controls to companies and goods outside the United States. We are not unmindful of the potential for legal conflict with foreign governments. However, where important United States interests are to be advanced and controls could not be effective without extraterritorial reach, we believe that jurisdiction must be asserted where adequate grounds exist. These controls, as applied both to the exercise by U.S. nationals of control over foreign firms and to the use of U.S. origin goods or technology abroad, represent a legitimate protection of our sovereign interests.

The jurisdictional reach of these controls is not unique. Throughout the long history of the U.S. export control program, goods and technology have been subjected to restrictions on their reexport or use abroad.

## IMPACT ON U.S. DOMESTIC AND INTERNATIONAL BUSINESS

In making this decision to amend foreign policy controls on oil and gas equipment, the Administration was aware that over the past decade energy related trade between the Soviet Union and the West has flourished. The U.S.S.R. has an enormous demand for imported capital, equipment and technology, while Europe has sought to diversify its energy supplies and promote employment in the steel and machinery sectors through exports to the East.

Western exports of oil and gas equipment to the Soviet Union resulted in a proliferation of licensing and co-production agreements between United States and European firms. Some U.S. companies deal with the U.S.S.R. through foreign subsidiaries and licensees because of the greater availability of competitive financing.

The Department of Commerce has the responsibility for assessing the implications for American business of U.S. foreign policy controls on energy equipment and technology sales by U.S. industry. Based on consultations with U.S. firms and examination of reports of contracts signed and under negotiation, as well as historical trade data, we have made the following estimates of the impact of the sanctions on U.S. business:

Over the next 3 years, the United States will probably lose $300-$600 million in exports, direct and through third countries, to the U.S.S.R. as a result of the December 29, 1981 controls relating to oil and gas equipment and technology.

Over the next 3 years, foreign subsidiaries as well as technology licensees of U.S. firms could lose as much as $1.6 billion in business with the Soviet Union as a result of the June 18 amendment and expansion of the controls.

## THE SIBERIAN PIPELINE AND WESTERN SECURITY

The U.S.S.R.'s plan to build over 12,000 miles of large-diameter natural gas pipeline in 5 years, including the export line to Western Europe, represents one of the most ambitious and strategically significant undertakings in Soviet energy development. It is prompted by the reality that sometime in the 1980's oil production in the U.S.S.R. will probably peak or even decline; thereby leaving the Soviets to choose between reducing supplies to Eastern Europe or foregoing revenues which contribute approximately 60 percent of annual hard currency earnings.

Should oil shortages emerge in the U.S.S.R., certain unpalatable choices will have to be made—whether to cut generous energy subsidies to Eastern Europe, or to reduce oil exports to the West which earn hard currency for purchases of foodstuffs, industrial goods and advanced technology. Soviet internal resources allocation may also be affected. Energy is already projected to absorb over 50 percent of the annual capital investment increment in the 1980 to 1985 period (up from only 5 percent in the 1970-1975 period) and this share cannot easily be increased without reducing the allocation to the consumer sector or to the military.

Perhaps most disturbingly, reliance by Eastern Europe on Free World imported oil would introduce new inflationary pressures on economies which are already overburdened. These nations for the most part are not presently earning sufficient hard currency from exports to the West to repay existing debts; thus they will have great difficulty paying for oil imports from Free World sources. In short, the nations belonging to the Council for Mutual Economic Cooperation (COMECON) would begin to feel more tightly the pinch of their own energy problems.

There can be little doubt that Soviet planners would prefer to avoid this outcome. The optimal solution is to convince the West to furnish to the Soviet energy industry billions of dollars of the most up-to-date and reliable equipment, generously subsidized at below market rates, in return for promises to repay these credits with deliveries of natural gas. In addition, if Soviet influence were established in one or more of the major oil producing nations of the Middle East, Europe might be caught in a double energy dependency. The U.S.S.R. would reap major gains from an energy crisis which it helped to precipitate.

The sanctions imposed by President Reagan offer the West a period to reflect on these issues. Certainly, there are important divergencies of views between leaders in the alliance on these issues. But underlying those differences exists shared values which will endure. What we need more is to lower the rhetoric and contemplate carefully our longer term interests.

I would now like to comment on the general issue of whether sanctions and national security export controls make a contribution to U.S. foreign policy and security interests, or whether their effectiveness is outweighed by their impact on U.S. business.

As to the issue of sanctions, it can in some cases appear that the immediate, tangible costs to the exporting country in terms of sales foregone and higher unemployment do outweigh the intangible future gains from the action. But even though intangibles are by definition hard to estimate, we should made no mistake as to the net benefits of these sanctions to the United States.

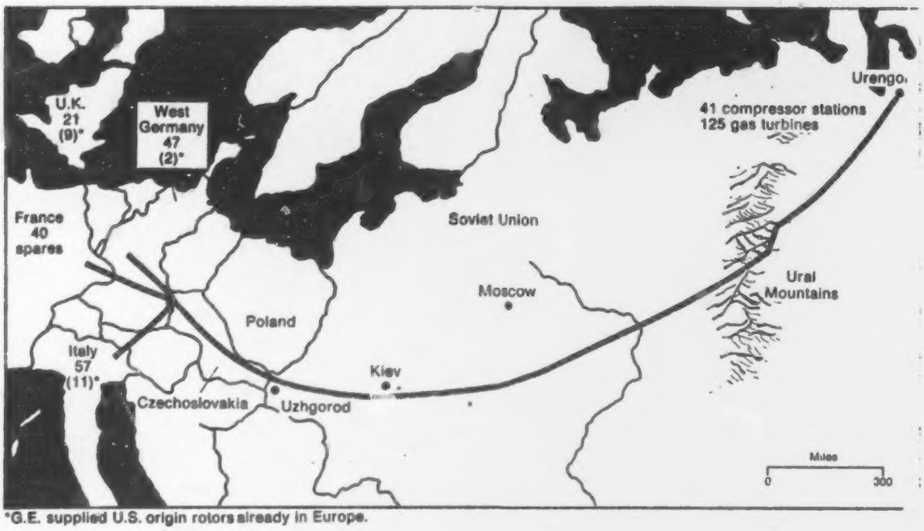
Our national security export control system serves a similar protective function by enabling the West to preserve its lead over the U.S.S.R. in technology relevant to military purposes. The control system, though cumbersome and sometimes inefficient, is very much like a fisherman's net. Sometimes the holes in the net are opened more widely. Sometimes they are drawn more closely. We have an ongoing series of consultations with the Allies and U.S. businesses over the spacing of these holes. But it would be extremely shortsighted to argue that the net should be taken away, or that mutual security would be enhanced by an unimpeded flow of technology from West to East. Under these conditions, the immediate financial benefits accruing to individual companies would be outweighed by the future costs to be borne by the society as a whole.

Some would assert that the Bloc countries have now achieved technological parity with the United States, and thus our control system is obsolete and should be scrapped. This is patent nonsense. The Bloc countries have made significant strides in the past 15 years—but much of that progress, particularly in the computer field, is attributable to an excessively liberal licensing regime and, unfortunately, circumvention of the control system by our trading partners and, of course, by outright theft and espionage conducted by the Soviets and their agents. Previous laxness in the administration of controls should not be used as a rationale for future irresponsibility.

Second, the best proof of the desperate need of the Bloc countries for imported know-how is offered by the impressive and expensive efforts they make to illegally acquire technology. The espionage arm of the Soviet Union, Poland, and East Germany to name a few, have found some excellent fishing in the industrialized democracies. We cannot, of course, prevent them from poaching, but we can substantially raise the cost of the catch.

In conclusion, I would like to stress that we recognize these sanctions will impose some strains on our relationship within the alliance and some hardships for the domestic and international business community. But are we to turn our back to what has happened in Poland? Should we conduct business as usual? Is the sanctity of the business contract more important than a demonstration of our resolve to keep a sharp focus of attention on these terrible events? The answer is of course "NO." And despite the media criticism of our announced sanctions and the strain we are now experiencing I happen to think we are much admired for once again asserting our American leadership role in standing for justice and freedom.

# EQUIPMENT FOR TRANS-SIBERIAN GAS PIPELINE



*G.E. supplied U.S. origin rotors already in Europe.

G.E. Manufacturing Associates
U.K.—John Brown
West Germany—A.E.G. Kanis
Italy—Nuovo Pignone

G.E. Licensee
France-Alsthom Atlantique

Senator MATHIAS. Thank you, Mr. Olmer.

Mr. Buckley?

## STATEMENT OF HON. JAMES L. BUCKLEY, UNDER SECRETARY FOR SECURITY ASSISTANCE, SCIENCE AND TECHNOLOGY, DEPARTMENT OF STATE

Mr. BUCKLEY. Mr. Chairman, I want to thank you for the opportunity to join in this discussion of the President's decision to expand sanctions to prevent the export of oil and gas equipment and technology to the Soviet Union.

I intend to address the basis of the President's decision, the effect of the decision, and the reaction of our Western European allies.

On December 29, 1981, the President imposed selected economic sanctions against the Soviet Union because of its role in the imposition of martial law and the suppression of human rights in Poland. Those sanctions included the expansion of export controls on the sale of U.S.-origin oil and gas equipment and technology and the suspension of all licensing of controlled exports to the Soviet Union. At that time, the President made it clear that if the repression in Poland continued, the United States would take further concrete economic and political actions.

Now, some 7 months later, martial law remains in effect, political detainees continue to be held, and the free trade union movement is still suppressed.

As a consequence, the President decided on June 18 to take the further concrete steps he had warned the Soviets about last December. Therefore he expanded the December sanctions covering oil and gas equipment and technology to include the foreign subsidiaries and licensees of American firms. This is an area of critical importance to the economy of the Soviet Union because of its dependence on exports of petroleum and natural gas for hard currency earnings and the significance the Soviets place on the development of a vastly expanded internal gas delivery system.

The June 18 decision was based on the authority granted to the President under the Export Administration Act of 1979 to prohibit exports where necessary to further significantly the foreign policy interests of the United States. The act gives the President to power to prohibit exports of goods or technology that are subject to U.S. jurisdiction or exported by any person subject to the jurisdiction of the United States.

We have taken note of the subsequent announcement of a slight relaxation of repression in Poland, but as Secretary Olmer has stated, these do not begin to meet our minimum requirements. We are, however, consulting with our allies on the implications of the recent Polish announcement.

The actions taken last December had immediate effect on manufacturers and workers in the United States. U.S. firms have lost a substantial amount of potential business with the U.S.S.R., the impact being spread across a variety of industries supplying parts for the Yamal pipeline, as well as heavy machinery and technology for other construction projects.

However, by only reaching U.S.-manufactured equipment, the December controls left open an important loophole which allowed the Soviet Union to obtain equipment from foreign subsidiaries and licensees of American companies which were subject to the December sanctions. Thus, the recent expansion of those sanctions not only makes them more effective, but more equitable as well.

The obvious focus of the expanded sanctions has been on exports destined for the pipeline project. Clearly, the U.S. export control actions of December 29 and June 18 have had a major impact on equipment and the construction timetable for the Siberian gas pipeline to Europe. The U.S. position on the project is well known. We believe European participation in this project to be ill advised and potentially harmful to our joint security interests.

Upon completion, the pipeline will allow the Soviets to earn, through gas sales, some $8 billion to $10 billion per year in hard currency. Such earnings will allow the Soviets to continue purchasing large amounts of critical Western technology for the modernization of the industrial base on which its military power depends, as well as help finance foreign adventurism. It will roughly double European gas dependence on the Soviet Union, and gas is a particularly difficult fuel to replace on short notice.

As you know, the administration over the last year has encouraged the allies to develop alternatives to Soviet gas to avoid any undue dependence which could make them vulnerable to Soviet pressures. The President's decision will clearly impede the construction of the pipeline, which is already behind schedule, and it will increase its cost as well as delay the Soviet Union's plans for a dramatic expansion of its internal gas distribution system.

But, let met emphasize that this impact on the Soviet economy was not in and of itself our primary goal. We are not engaged in economic warfare with the Soviet Union. Above all, we seek an end to the repression of the Polish people. The sanctions imposed against the sale of this equipment increase the internal costs to the Soviet Union of the project and cause an additional strain on already thinly stretched Soviet resources. The President wants to make clear that the Soviets will bear those costs until there is real progress toward a restoration of basic human rights in Poland.

The extension of the sanctions obviously concerns our allies and affects our relationships with them. When the President made his decision to expand the controls, it was clear that it would not be welcomed by key allied governments. Since their expansion, our European allies have voiced their concerns individually and through the Commission of the European Community. Their complaints have centered around their contentions that sanctions will not produce desired results in Poland, that our actions exceed our legal jurisdiction, that they are extraterritorial and retroactive in effect, and that we failed to consult with them before making our decision with respect to the sanctions.

Our allies, of course, attach greater significance to trade with the Soviet Union than we do. In addition, all of Europe has felt the pinch of the current recession. Jobs and investment related to the pipeline project were expected to provided a significant boost for certain hard hit firms in heavy industry.

The President took these considerations into account in coming to his decision. He clearly recognized the effect of the economic sanctions both in Europe and in the United States. Nevertheless, the President decided that in the face of the continuing Soviet support of the repression of the Polish people, the costs of U.S. inaction simply outweighed the sacrifices that would have to be made to bring home to the Soviets our seriousness of purpose. The President had clearly stated that he would be forced to take additional measures if the situation in Poland did not improve. It did not, and he kept his word.

Our allies have questioned the legal basis of our actions. We believe, however, as Secretary Olmer has stated, that our sanctions are proper under international law. We believe that the United States can properly prescribe and enforce controls over exports and re-exports of U.S. goods and technology and over the actions of foreign subsidiaries of U.S. firms.

The provisions in private licensing contracts regarding compliance with U.S. controls demonstrates that the possibility of their being invoked is a familiar and accepted part of international commerce.

With respect to our relations with our allies, many have cited the pipeline decision as the proverbial straw that will break the camel's back and lead to a damaging policy of retaliation through higher tariffs or other measures. We disagree and believe that our differences with our allies can be resolved through continued constructive consultations. We intend to work hard toward that end. And I believe it is clear that our allies wish to work to that end with us.

I would also stress that despite our much-publicized differences, we still share a community of interests far more substantial than the issues which are in dispute at the moment. We certainly share the common goals of helping Poland achieve an end to martial law, the release of all detainees, and the reestablishment of the dialog between the government, Solidarity, and the church.

I hope this overview will provide some useful background regarding the context and effect of the President's decision to expand the sanctions against the Soviet Union for their role in the repression of the Polish people.

I look forward to hearing your views and will do my best to answer such questions as you have.

Senator MATHIAS. Thank you very much, Secretary Buckley.

Mr. Chairman, do you want to begin?

The CHAIRMAN. No; go ahead.

Senator MATHIAS. Both of you are, I know, familiar with the old legend of the dragon's teeth. Now, when you planted one of the dragon's teeth, a soldier sprang up.

I am wondering if these sanctions might not end up by being a kind of technological version of the myth of the dragon's teeth, that by imposing these sanctions we will be causing new technologies to spring up in other parts of the world where they do not now exist, in order to provide the equipment and the services that we are embargoing, and they will not only ultimately provide what we refuse to sell, but they will remain in existence as permanent competitors to U.S. business, a permanent transfer of jobs that otherwise existed in the United States for years to come.

Is that a possibility?

Mr. OLMER. Certainly it is a possibility, Senator, but the question is immensely complicated, and I will try to respond regarding one small part of it, the technology.

There is no question the United States is the world's leader in oil and gas exploration, refinement, production, transmission technology, bar none, and we see no evidence of any competitor on the immediate horizon.

There are a lot of products and technologies of less than great sophistication involved in the building of the 12,000 miles of pipeline in the Soviet Union, no question. Relatively a small proportion, as I think Senator Percy indicated, is what we would call high technology. In the area that we are dealing with presently, the question of rotor sets, the building of turbines with those rotor sets, the building of compressors with those turbines, and the construction of compressor stations from the aggregate, we are talking about some unique American technology which has been licensed abroad.

One of the reasons that competition has not developed is that there just is not a huge market for those kinds of technologies and products. In effect, the world demand has been divided up, the market has been divided up, and some U.S. firms do one thing, and others perform another kind of function in the process of preparing a compressor station.

In my judgment, if others, if foreigners were to develop the competitive ability to beat out the U.S. supplier of these unique parts, it would require several years and a rather major undertaking. In the final analysis, it would be a serious competitive effort between the two to provide the relatively few purchasers of those components with end products.

So I do not think for some time we are going to face that sort of a reality. (a) We are presently the world's leader, and (b) the market for these kinds of goods and services is rather limited. Over time it could happen, but not within the near future.

Mr. BUCKLEY. Mr. Chairman, if I might add to those comments, No. 1, technology is not static, and sooner or later people will catch up to our present level of development. But because we are in the lead, we can continue through refinements to stay in the lead. This has been basically true of various oilfield exploration and testing techniques. We simply have been able to stay ahead of the pack and therefore maintain our competitive edge.

I believe this will happen here as well, but in the meantime there is that critical gap spoken of by Secretary Olmer. The period of time in which alternatives would have to be found for these rotors will cause significant delays and disruptions in the process of working to complete the pipeline and meet schedule delivery. The costs of these delays and disruptions to the Soviet economy and to the Soviet earning capacity are very, very significant.

Senator MATHIAS. I do not think I have heard anyone deny that this action can cause some delay. But what Mr. Olmer has described is exactly what I think we have to think about. What happens after this period of a couple of years of delay? Suppose our action has driven either the West Europeans or the Soviets themselves to develop some part of this productive capacity in markets which, as Mr. Olmer has described, are very limited markets? Then we have created a situation which will be very difficult, certainly, at the very least, more difficult for us to compete in in the future because the world productive capacity will have been increased, the market presumably will not have been enormously increased, and we will, in fact, have encouraged our own competition.

Mr. OLMER. I think that that is a fair statement; yes.

Mr. BUCKLEY. But against that, Mr. Chairman, must be balanced what we believe would be the larger costs of remaining passive in the fact of unacceptable Soviet behavior with respect to Poland.

Senator MATHIAS. Let's look at that larger cost. As you have described the motivations for the action today, apparently the sanctions are grounded on several different concerns, Poland being one; the strengthening of the Soviet economy by the transfer of hard currency from the sale of gas; the possibility that Western Europe will be too dependent on Soviet energy sources; and then, as Mr. Olmer said in his very eloquent statement, the kind of message that we have to send, a message of outrage over events in Poland.

What would it take in your judgment to induce the President to lift the sanctions, action on all of these fronts? Action on any one of them or any combination of them?

Because when we talk about messages to the Soviet Union, they may be as confused as I am as to exactly what we are asking them to do.

Mr. BUCKLEY. I think the President has been very clear. The objective—and this is drawn from his statement of June 22—"the objective of the United States in imposing the sanctions has been and continues to be to advance reconciliation in Poland." That is a very simple, straightforward statement, and in a subsequent exchange at a press conference, he underscored the fact that if there is a significant change in Soviet behavior, then all of these things are up for review.

Now, the fact that we see specific connection between the sanctions we chose and the impact on the Soviet economy is not coincidental. The fact is you choose your sanctions with care, with great care, in order to inflict harm. Otherwise it would be a meaningless exercise. And we have recognized from the very early time it is in the area of oil and gas technology and development and associated activities that we have a particularly unique position.

That is why way back in 1978, in response to human rights violations within the Soviet Union, we selected this particular area, why that was expanded to Afghanistan, why this has been the major focus of our response to Poland.

Senator MATHIAS. So what you are saying is that if there were a major change in the climate in Poland, then the President would review the other things, the hard currency.

Mr. BUCKLEY. No, he would be reviewing the sanctions. That is what he has said.

Senator MATHIAS. And you pin it all on Poland?

Mr. BUCKLEY. The President has.

Senator MATHIAS. Why, then, does Chancellor Schmidt say, "After President Reagan's very successful trip to Europe and his discussions at the Versailles conference, we thought we and the United States were on the same track," if it is this clear? They sat in the same room. Perhaps both of you were in the same room also.

Mr. BUCKLEY. I was not. Perhaps Mr. Olmer was.

[Mr. Olmer nodded in the negative.]

Mr. BUCKLEY. All I can say is that the Versailles summit was dealing with continuing economic problems and objectives within the alliance, within the seven who were attending. The sanctions, as such, are a separate subject. In December the President made it clear that if there were not some kind of response to the sanction announced at that time, that they would be extended.

Senator MATHIAS. In terms of United States foreign policy and our relationships with our allies, particularly our NATO allies, it obviously was not clear to them that the sanctions were a separate subject.

Mr. BUCKLEY. I have a feeling, Mr. Chairman, that this is a classic example where four or five irritants of various dimensions come to a head at the same moment. We have the problems with steel, which is a preoccupation of Mr. Olmer. We have the agricultural problems. And we have this serious disagreement here.

Senator MATHIAS. Mr. Olmer?

Mr. OLMER. I might just say, as so often happens, the wish is the father of the thought. I believe our allies well understood the seriousness of our purpose and the contingencies which would fall into place in the absence of change. Secretary Buckley and I participated in a series of discussions over a period of months, beginning in January of this year. It certainly was my impression that it was not sufficient to speak directly to some of the people at our level with whom we were dealing to get a response that indicated an understanding with clarity of what you had said, and walked away feeling that you had then done your job. It does require some repetition. Perhaps that is the art of diplomacy, which I certainly do not feel that I have mastered.

Senator MATHIAS. Well, as Secretary Buckley knows, when you are engaged in a political campaign, you have to say something three times, first to tell them what you are about to say, and then say it, and then you tell them what you have said. I suspect that diplomacy is not all that different.

Mr. OLMER. I think we went up that scale and back down it several times.

Senator MATHIAS. A week ago today the Wall Street Journal made the point that Monsieur Mitterand and Mrs. Thatcher are ordering their countries to breach their contracts with GE, contracts which specify that the licensees will abide by United States export law, and this is based on their concept of extraterritorial application of United States law.

The adminstration has had to think about the kind of legal problems that are going to flow from these exercises, about the problems of a company which 1 year ago bought a piece of equipment, actually took delivery of it, the equipment rests in their warehouses in London or in Frankfurt or some other place. They paid for it, all a perfectly legal transaction. And now they are told that it does not really belong to them. Because they bought and paid for it and stored it for 1 year, that does not give them the right to resell it in the pursuance of a sales contract they may have made, if it involves the pipeline.

Now, what is the administration's view of the legal issues that will flow from these sanctions?

Mr. OLMER. Mr. Chairman, the imagination of the international legal community is perhaps only exceeded by that of the Washington legal community, and I have no doubt that we will be involved in protracted debate. We do state unequivocally our position that we have such authority. Without getting into a legal debate, I would say to you that the contracts undertaken by those people in Europe included a clause that committed them to keep current regarding U.S. export regulations, and committed them to receiving authorization for the re-export of any products and U.S. technology which might go to the Soviet Union.

So, that is to say, we maintain that our export control laws come into force and effect at the time of re-export. It is not a new phenomenon created in December or in June, but it is a part and parcel of the means by which we have applied our export control regulations over time, with the knowledge and obviously with the consent of our foreign trading partners.

Senator MATHIAS. Well, you may get involved in more than debate, more than legal sophistry on this question. Just how far is the administration prepared to go? International companies frequently recruit former cabinet officers, former politicians for their board of directors, people who have even had jobs like Under Secretary of State or Under Secretary of Commerce.

Now, let us suppose that a former foreign minister of France or a former chancellor of the exchequer or somebody like that—I am just hypothetically picking some possibilities out of the air—that a former chancellor of the exchequer is a member of the board of one of these companies, and he checks into the Madison Hotel here in Washington. Are you going to send the U.S. marshal down and pick him up and put him in the slammer in Washington for violation of these sanctions? Just how far are we going to go?

Mr. OLMER. At present, the Commerce Department does not have the power to arrest or even, I might add, to issue subpenas, but I think that it would be inappropriate to speculate on the potential criminal application of these sanctions until and unless we get a better fix on what the Europeans are intent upon doing. As I said in my introductory statement——

Senator MATHIAS. Mrs. Thatcher is pretty clear about what she is intent upon doing.

Mr. OLMER. Well, there is intent and there is intent. There is an intent to reach the public, utterances in the media, and there is the actual putting together of the directive which would cause a given company to circumvent or violate our sanctions.

We do not now have any evidence that any company is actively preparing to circumvent or violate those sanctions. Obviously, we are contemplating a number of options available to us, and I would say in all honesty the contingency of which you spoke, Mr. Chairman, is not one of them.

Senator MATHIAS. What about civil action against the companies, if you can get hold of one of their officers?

Mr. OLMER. You are familiar, I am sure, with the civil penalties, the most powerful of which is the placement of the offending firm on the denial list, meaning they cannot engage in international trade, at least to receive exports from the United States, of a character not merely limited to oil and gas related——

Senator **Mathias**. Any exports?

Mr. **Olmer**. Any exports. That is correct. That is an option open to us under the act which the Congress passed in 1979.

Senator **Mathias**. An option not without cost to the American sources of those exports.

Mr. **Olmer**. That is correct.

Senator **Mathias**. To the workers who would make those exports.

Mr. **Olmer**. That is correct. Yes, sir.

Senator **Mathias**. We have a number of differences with our allies. Steel is one that is very much on my mind, as I am sure it is on Senator Percy's mind. Both of us represent steel-producing States, and we have perhaps only just begun to see the nature of that controversy, and we have perhaps only begun to measure the seriousness of the differences that may arise from the steel problems.

How do you think our friends in Europe would assess the pipeline issue as against the steel issue and the agricultural issue and the other problems that both of you have mentioned?

Mr. **Olmer**. I would place the oil and gas sanctions policy issue on a political level, not to deny the economic consequences of those sanctions, but I think it is of greater political significance as between the United States and our allies. The steel issue is, in my judgment, of more serious economic effect. As you may know, Senator, I am leaving this evening for Brussels to carry forward some negotiations on steel, but here is an example relative to your earlier question about, did U.S. policy come across authoritatively and clearly?

We have been discussing the strain between the United States and Europe regarding steel over a period of many months, and we have described the anguish which is taking place in the U.S. steel industry with great clarity, I can say without any reservation. We have told the Europeans they were in jeopardy of seeing the full wrath and effect of some very stringent penalties confronting them unless they altered their behavior of shipping subsidized exports to the injury of the U.S. industry. And we pointed this out time and again, and yet the figures on exports from Europe to the United States last month reveal that not only didn't they heed us in the sense of maintaining their same, I think, excessive level, but they increased it, as they have done in the preceding several months.

There is no question of an understanding of the seriousness of our purpose or the basic facts, but I suppose it is the exercise of free will.

Senator **Mathias**. But that is a good point. Did we give the same adequate notice in connection with the sanctions, because the President went to Versailles. They came out of Versailles. They had an agreed statement on trade with the Soviet Union which reflected all of the concerns that we have discussed here today, and Chancellor Schmidt said, we thought we had an agreement.

Mr. **Olmer**. I have seen statements by leaders in the European steel community which indicate——

Senator **Mathias**. These were not leaders of the European steel community. This was the President of the United States, the President of France, the Chancellor of Germany.

Mr. **Olmer**. You are drawing an analogy, I thought, between clear direction from here and understanding over there, and I am saying that there was no clear, apparently, understanding on their part, or there was simply an exercise of free choice, and I am not familiar with what happened at Versailles. I happen to believe that our position was stated clearly, and that certainly the leaders of the free world on the other side of the ocean understood full well what the President's intentions were.

Senator **Mathias**. Senator Percy.

The **Chairman**. I would like to start out with a statement, Secretary Olmer, that you made in your prepared statement. "I happen to think that we are much admired for once again asserting our American leadership role in standing for justice and freedom." We share in common coming from the State of Illinois, as does the President. Do you think this policy is much admired in the State of Illinois by Illinois unemployed workers, or those in fear of losing their jobs? Do you think they think it is a prudent and wise policy in the 6 months it has been in effect? Has it had any effect on the Soviet policy?

Mr. **Olmer**. Well, your first question first. In terms of our response, Senator Percy, the only measure I have of how workers feel about these sanctions has been expressed through their leadership in the AFL-CIO, and the European free trade unions. They have overwhelmingly said, press on.

Now, whether or not that means in the aggregate, if a poll were taken, what side of the vote we would come out on, I would not want to speculate, but I am encouraged by that expression of support from the workers in America and the workers in Europe.

The **Chairman**. I have not always found a correlation between what the broad-based worker feels and what the union leadership feels. Sometimes there is a vast difference there. Sometimes there is a vast difference between political people and their constituents, too. But in this particular case, I have talked to a great many workers throughout Illinois. I came from Peoria, where the bumper signs on the cars say, "If you are the last company in town, turn out the lights."

Rockford is suffering unprecedented unemployement. I had a sit-in 2 days ago with unemployed steel workers in my office. I talked to them half an hour on the telephone from here. Two weeks ago I was at their union headquarters sitting for a weekend talking with 169 people that were out of work and had been out of work for 6 months and couldn't find jobs, and they see, as I said, 75 percent of the products affected by the sanctions are manufactured in Illinois.

They see tens of thousands of jobs affected, and they do not see any real effect coming from it. What is the effect? What impact are we having on Soviet behavior?

Mr. **Olmer**. That is a question more properly answered by my colleague from the Department of State, but if he would permit me, I would only indicate my own perception that the recent easing of conditions in Poland might be somewhat related to the seriousness of our purpose. I do not think we have any scientific way of measuring that, but I would not deny that possibility, but again, I would like to defer to the State Department for a response to your foreign policy questions.

The CHAIRMAN. Secretary Buckley?

Mr. BUCKLEY. First of all, as modest as were the steps announced in Poland, they may very well reflect the fact that the sanctions are hurting. As a matter of fact, there has been extensive debate within Poland about what accommodations might be made because of the extraordinary impact that our sanctions are having directly on the economy of Poland, but your question was addressed to the Soviet Union.

The CHAIRMAN. That is right.

Mr. BUCKLEY. We do not know what they might be doing behind the scenes with respect to these very modest relaxations, but whether or not these sanctions actually bring about a dramatic shift in the Soviet position, they can give the Soviets pause before they commit their next act of direct or indirect aggression, and what we can say is that these sanctions do have a very material impact on the Soviets.

For example, they have an impact by virtue of affecting the ability of firms to deliver on their contracts for turbines and compressors and so forth. They would be forfeiting nearly $800 million worth of subsidized financings. That is a very large chunk out of the Soviet capability at this time.

Furthermore, a 2-year delay of the completion of a pipeline would mean that in order for the Soviets to be able to make deliveries on schedule through what is still a little bit of surplus capacity in their existing pipelines would mean significant diversions of natural gas from Eastern Europe and Russia itself. It has been calculated that such a diversion, which we believe they intend to make, will cost them in oil equivalent, and therefore the ability to export oil, approximately $400 million a year.

The CHAIRMAN. But to get back to my question. I did not talk about the pipeline; I am talking about the fact that 75 percent of the products affected are manufactured in Illinois. Virtually none of them have anything to do with the pipeline. They are totally unrelated. In my opening statement, I mentioned what they were: grain drying equipment, machine tool cutting machines, Caterpillar pipe layers. They are not for the pipeline at all. Komatsu got that business. There are for internal usage. Fiat-Allis crawler tractors, nothing to do with the pipline.

My quesiton is: Why not separate the two issues, then? I put the question to Judge Clark when he very thoughtfully chaired a meeting of six manufacturers in the situation or crisis management room of the White House. The question was suggested, I thought nobly, by Jack Welch, the chairman of the board of General Electric. In fact, none of these other manufactures in this room—six of them—have anything to do with the pipeline. And Judge Clark, in his letter back to me, said, we are reviewing this case. The case I happened to write about with Sundstrand Corp., selling pumps and pump technology, grain drying.

Judge Clark said, we are reviewing this case and a number of others in light of the comments made at the meeting, especially those of Jack Welch. "Although I can obviously make no forecast at this time, it may be that some accommodation can be reached."

Could you provide us with an update as to whether there is consideration being given in the administration now to separating the pipeline from those sanctions on equipment that have nothing to do with the pipeline? There is no unique technology, no high technology. It is generally old technology available any place else, and the Soviets can buy it immediately, exporting those jobs to Japan or wherever it may be. We are undercutting the American economy. We are not hurting the Soviet Union, and we are not impressing the Soviet Union by kicking ourselves and our allies in the shins.

Mr. **Olmer**. Senator, I will check into your calculations that 75 percent come from the State of Illinois. It is certainly not my intention to target the great State of Illinois, to which I owe a great deal. It is a fact that we are in a period of interim regulations. We have been collecting comments from the private sector. We will be scheduling, at the request of one member, a meeting of the President's Export Council Subcommittee on Export Incentives and Disincentives, containing some leaders in American business, over the next couple of weeks, and I think we will come up with a comprehensive look that will enable us to alter those regulations if, as you suggest, they have no effect on the development of Soviet oil and gas exploration, production, refinement, and transmission.

That is what we intended to target and believe we are targeting, and we will look at that very carefully.

The **Chairman**. And I might say that at that meeting, chaired by Judge Clark, the Secretary of Commerce, Mr. Baldridge, heard the argument made. It was a compelling argument, and none of the manufacturers really were talking about the pipeline. They were talking about other things. We can say it now; the announcement has been made 40 minutes ago; the administration has wisely decided to not impose a grain embargo on the Soviet Union, but to extend the agreement for another year.

Sales of grain to the Soviet Union use their precious foreign currency, thereby making Soviet military purchases more costly, so it is a benefit to us. I cannot see how we are really hurting the Soviets. The Secretary used the word, it is our intent to inflict harm, to inflict hurt on them. How are we hurting them, when they can just turn around and buy equipment some place else, exactly the same thing, identical equipment in many cases, and build up strongly the economy of Japan at the expense of the American economy. As things go in Peoria, they go in the Nation, and that is what the workers of Peoria and around the State, Springfield and Fiadalis and other cities, and firms such as Sundstrand, cannot understand—our economic policy.

We are supposed to be hardheaded businessmen that do practical things. We are hurting ourselves, shooting ourselves in the foot, as we say, not hurting the Soviets at all in this area. The pipeline we can take separately, but these other areas I would hope the Commerce Department would review vigorously, now that Judge Clark has said we should perhaps make some accommodations there and give consideration to it.

I think when you look into it you will find that the harm is right in the State of Illinois. It cannot be understood or supported by the people. They cannot understand it. If their U.S. Senator cannot support it, who supports this administration a great deal, they just cannot see that it makes any sense at all.

Could we have your pledge that you will look at that conscientiously and carefully, to see whether or not their is not a rationale for separating these issues and treating the pipeline separately?

Mr. OLMER. We will review the entire range of affects of the sanctions policy and take into account very carefully the comments in the private sector, and we will let you know prior to the promulgation of final regulations. I can assure you of that.

The CHAIRMAN. The Chairman of the Agriculture Committee is with us now. Would you feel that the grain embargo imposed by President Carter did real permanent injury to the United States as a reliable supplier of grain throughout the world?

Mr. OLMER. Throughout the world, no, sir. Within the Soviet Union, and again, this is somewhat out of my field of competence, but within the Soviet Union, it does seem to me that the market share we had enjoyed prior to President Carter's grain embargo will not come back to us at any time in the near future. We have been replaced in the Soviet market.

The question of whether or not that was, or could have been, an effective policy, of course, it is easy to look today and decide what you should have done, but among the things that were not done effectively and caused that to be an ineffective instrument of foreign policy, was the inability to get the support of other grain producers, all of whom were our strong allies. They took advantage of the embargo, and replaced us in that market.

The CHAIRMAN. Just as the President said, these policies are not good unless the allies stick with this. We made a real effort in this case of Poland, and no one feels more strongly about Poland than I, with 1 million Polish Americans living in the Chicago area. I know how strongly they feel. I feel strongly. If we could have really brought about a course of action and changed that action by what we were doing, and we could have, if all of the allies had stuck together.

But they didn't. They didn't in the grain embargo, and they didn't in this particular case, and certainly in this case they have openly fought us, and I should think when you say in your statement that we are much admired for asserting our American leadership and standing for justice and freedom, I should think they would be having champagne parties in the Kremlin when they read a statement by the French foreign minister, Claude Chesson, who on French television said:

> A progressive divorce was developing between the United States and its allies in Western Europe. We no longer speak the same language. There is a remarkable incomprehension, and that is grave. The United States seems totally indifferent to our problems. It is the major ally and the world's biggest country, and we do not even talk any more.

Here is our longest single historical ally that we have had, and their French foreign minister is saying that about us, and we know what Margaret Thatcher and what Chancellor Schmidt and others have said. I just do not see that we are impressing them. If the

Kremlin had plotted this policy, they could not have done a better job to bring them together with our allies against the United States, to defeat us. We are not going to have the effect that we hoped for.

I will come back for further questioning.

Mr. BUCKLEY. May I note, Mr. Chairman, that in the last few days the Chancellor of Germany and the Foreign Minister of Great Britain have both underscored the fact that the family remains healthy, although there may be disputes within the family.

The CHAIRMAN. Could I come back to just finish this one question that I didn't finish with Secretary Olmer? Let me take you back to your role as the vice president of a great American corporation, supplying products all over the world.

Do you believe the statements made by Lee Morgan, chairman of Caterpillar, and every other company that was sitting in that room in the White House when they say: We are not just hurting our business relationships with the Soviet Union; we are destroying the credibility of American manufacturers of all kinds as a reliable supplier.

Any country that may have a political difference with the United States some time in the future, and there are a lot of them in the Middle East, for instance, would look twice at buying an American product, if they might be embargoed for political reasons on spare parts, for instance—these manufacturers, every one of them, say we are hurting permanently the American reputation as a reliable supplier, and therefore undercutting the economy.

Do you accept their statements as factual and as objective as they could make it, because it comes from some of the finest manufacturers and finest Americans I know? And they wouldn't say that in the White House to this administration unless they deeply believed it and could absolutely prove it. Permanent damage is being done to American industry and American product. As the Under Secretary of Commerce, do you accept that?

Mr. OLMER. I have great regard for both Lee Morgan and Jack Welch of GE and others, but in my judgment they have no basis on which to make flat assertions of absolute fact of long-term consequences which have yet to be determined. If so, they are possessed of the prescience that I am not privileged to share.

I would only say that we recognize that there are some risks to long-term business relationships, but I think we can overcome them. I think the most important thing we have to do now, Senator Percy, is not to turn around and react to the short-term economic consequences of the President's policy.

The potential ill effects in a business sense were carefully calculated on the best factual basis that we could bring to bear, and we, as you well know, Secretary Baldridge and I worked very hard to do that, to bring to the attention of policymakers in Government the effects on U.S. business of the sanctions policy.

I think they were known. I think the inability to calculate long-term consequences is something that we will have to live with for a while. It is, of course, our hope and expectation that these sanctions will not need to be in place indefinitely. We would be delighted, I am sure, to urge the President to review those sanctions in light of the three conditions he announced with respect to Poland. I think it would be a mistake, and I certainly would not recommend it, that we fall back on that, because the judgment and, in my view, it cannot be a factual assessment, but a judgment as to the long-term consequences to the American business reputation, we are still too good internationally for that to have that sort of effect.

The **CHAIRMAN**. Thank you, Mr. Chairman.

Senator **MATHIAS**. Senator Helms?

Senator **HELMS**. Thank you, Mr. Chairman.

The problem may be that for 20 years or longer the foreign policy of the United States with respect to the Soviet Union has been built on bits and pieces, not necessarily cohesive, certainly not. We have lost the moral imperative of whether we do, in fact, intend to resist the spread of tyranny around this world, and I do not wonder that the French or any others are bewildered and confused about our policy, whatever it is, because we have had ball bearings sent, followed by a statement that communism is bad. We have exported our technology, and issued a press release that communism must not be allowed to flourish in the world.

The truth of the matter is that the French do not believe that we mean it, and I do not think they care whether we mean it now, because they take it on the basis of what is in it for us. Now, these trading partners in the Kremlin, what have they done, Mr. Chairman, Mr. Buckley, Mr. Olmer, to show one iota of good faith on anything? And yet we fall all over ourselves and say, well, we must do this and we must do that, and I could come and plead for North Carolina interests, and I do not blame the Senator from Illinois for doing that, but really, what does that have to do with Afghanistan, Poland, Africa, and Central America and all around the globe where the Soviet Union, either directly or indirectly, is imposing tyranny on the people of the world?

So, maybe what is needed more than anything else is a consistent policy, to say, no, we do not deal with terrorists, slaughterers. We are just going to cut it all off. I could be a little bit picky about the grain issue. At least when the grain is sold to them, we get cash, and it is consumed, and as chairman of the Agriculture Committee, I can make the argument, and I think it is defensible, that the more we encourage the Russian people to upgrade their diet from potatoes and whatever to use of grain in the form of chicken or pork or whatever, the more likely they will be insisting upon a continuation of that upgraded diet.

But it is confusing to look at the unemployment situation, the economic situation in this country and relate it to whether we sell or export technology to the Soviet Union. But the economic distress in this country was not caused by any embargo on technology.

Now, let me ask, the Soviets have, do they not, a rather massive program of industrial espionage in this country with respect to our technology? Isn't that a fact?

Mr. **OLMER**. An absolute fact. Yes, sir.

Senator **HELMS**. We read about the growing concern in the high tech field, and I think it is as a matter of historical record that part of the warfare between freedom and communism is economic, and what the Soviets want with this pipeline is to get other nations dependent upon them. They want to become a reliable supplier of something. I wonder what France and all these other countries think they will do if the pipeline is completed, when it is completed, and the Soviets say, you either cave in on this demand of ours or we will cut it off.

Do they have no vision about that, Mr. Buckley? Has this been discussed with them?

Mr. BUCKLEY. It has been discussed, Senator, at very great length. You may have noticed an article in the Washington Post a couple of days ago by the Finance Minister of Germany, in which he is careful to point out that in their calculations, they will have kept their utilization of Soviet gas at levels where, No. 1, it will affect only *x* percent of their total energy and *y* percent of their natural gas, and that they are taking measures in terms of storage and convertibility of oil and gas, and so forth, to avert the kind of predicament you speak about.

Nonetheless, that continues to be a great concern of ours. We continue to urge this point with not only the German but other officials, and we are continuing a major effort to determine, to outline alternative sources of energy so as to keep a lid.

Senator HELMS. Back to the French minister, quoted by my distinguished chairman. I would like to urge him to take a look at the subsidized exports by his country. Right now, that is an economic problem we have with them, and if I have anything to do with it, we are going to go as far as we can in meeting fire with fire. They had better wake up and smell the coffee, as Ann Landers says, because this Nation cannot sit back much longer and cover in the face of statements by so-called allies when they are undercutting us at every turn.

I thank you very much, Mr. Chairman, for granting me the time.

Senator MATHIAS. Senator Pell?

Senator PELL. Thank you, Mr. Chairman.

Mr. Buckley, Mr. Olmer, is there any NATO ally of ours that supports the sanctions that we have put into effect?

Mr. BUCKLEY. I cannot think of one offhand.

Senator MATHIAS. The classic answer to that is, give me a week and I might think of one.

Senator PELL. Another point here is that the new sanctions linked improvements in Poland to the exports of gas- and oil-related equipment and technology to the Soviet Union, but does that mean that if the situation improves in Poland, we then—that that is a prime factor, and we would then take the sanctions off, or would we continue to be upset about the European dependence on Soviet energy which provide the Soviets with hard currency earnings?

Mr. BUCKLEY. We have expressed for a matter of months and years our concerns about energy dependence, the prospect of that. We have expressed certainly in this administration our belief that in terms at least of credit supports, subsidies and so on, that we ought to take into very close and careful consideration the strategic impact of facilitating the ability of the Soviet Union to increase dollar earnings, hard currency earnings, because of its reinvestment in improving the industrial infrastructure that increases the Soviet threat; but when speaking of these specific sanctions, they were issued in the first stage, in December of 1981, as a direct reaction or response to the repression in Poland, and when they were extended a couple of weeks ago, the President stated explicitly that these were linked to the fact that repression continued.

Senator **Pell**. Does there seem to be any dichotomy in the policy if we continue to explore the sale of wheat to the Soviet Union, which is to our benefit and the benefit of our farmers, at the same time saying that the Europeans cannot sell their technology under license from us to the Soviet Union? Do you see a contradiction there?

Mr. **Buckley**. No, I do not. We have been very sharply focused in the choice of sanctions, and they were sanctions that were designed to affect areas of very great importance, not only to the Soviet Union but to the ultimate development of their economy. We have never advocated an across-the-board trade embargo. We are not engaged in economic warfare.

We have never suggested to the Europeans that they stop selling agricultural products to the Soviet Union, and in fact, in recent years, they have increased their sale of agricultural products in very sizable numbers, billions of dollars worth. We see no purpose in invoking a sanction that has no bite to it. The withholding of American grain will not affect the ability of the Soviets to buy grain. We learned that a couple of years ago.

Furthermore, the sale of grain does not result in a transfer of technology or a strengthening of the inherent economic capabilities of the Nation. By the same token, it absorbs hard currency that could otherwise be utilized for those purposes. So, we believe that we are talking about apples and oranges.

Senator **Pell**. From an historical viewpoint, can you recall any good examples in history where economic sanctions have produced a change in policy in the Government?

Mr. **Buckley**. I am not an economic historian, but I know some studies of this sort are going on, and perhaps Mr. Olmer can point to some examples.

Mr. **Olmer**. I think our sanctions have had a desirable effect in impeding the growth of Soviet military-industrial capability, and my evidence for that is the enormous effort they expend to steal and otherwise obtain through espionage the know-how that they have not been able to come up with themselves.

Senator **Pell**. My question, though, is whether you know of any examples where economic sanctions have changed policy. Obviously, they have changed the economic circumstances of a country, and as Senator Kennedy has pointed out, one of the beauties of a dictatorship is that you can say, everyone will eat potato skins, but we cannot do that.

Mr. **Olmer**. Absolutely, it has changed policy. It has caused them to make some very hard choices on whether they will continue to expend money in one area of their economy or in another area of their economy. I do not think we have the ability to determine with any precision the means by which those decisions are calculated, but it has had an effect.

Mr. **Buckley**. I thought you were addressing changing that activity which gave rise to the sanctions. I think the fact that it may be difficult to point to specific examples, and I do not mean to imply that they do not exist, should not serve to suggest that sanctions do not have an impact and do not have an effect. It can have a very large effect on future actions. It can also cause the choices alluded to by Mr. Olmer. We note that the sanctions that we have announced will have a definite impact on Soviet earnings, on Soviet costs, and Soviet ability to expand their energy infrastructure.

Senator PELL. I guess my problem is, I am searching my mind for when a sanction really changed the policy of a government. I am thinking of economic sanctions vis-a-vis Cuba. I think that rather than changing the policy in our direction, it helped thrust her into the arms of the Soviet Union. I am trying to think of something——

Mr. BUCKLEY. That was before the sanctions were invoked.

Senator PELL. I am just trying to think of any other example you might cite where economic pressures have produced a change in policy.

Mr. BUCKLEY. I believe the restraints that we exercised at the time that Turkey was a major exporter of illegal opium and herion have had an impact. In fact, it has caused Turkey to withdraw from that market.

Senator PELL. I was not familiar with that example, and I congratulate you on producing it.

Mr. OLMER. Senator, do you think our human rights policies in South Africa have had an effect of ameliorating conditions of the blacks in that country?

Senator PELL. No. I think that improvement is the result of time. I do not think our policy has had much impact. That would be my view. You would have to probably disagree with that.

At any rate, let me mention another specific point. Section (6)(4)(e) of the Export Administration Act of 1979 says that the President will consult with Congress before imposing any export control in every possible instance. When was Congress notified or consulted on the June 18 decision?

Mr. OLMER. Within 1½ hours of the decision having been made, telephone calls were made to staff of both the House and the Senate Foreign Relations Committee. In the case of the Senate, I am advised that an offer of a briefing was declined. In the case of the House, the briefing did take place.

Senator PELL. Thank you very much. I was not informed of that. I am glad to hear that. That is all.

Thank you, Mr. Chairman.

Mr. OLMER. May I make a remark regarding whether or not others have joined with us in imposing sanctions? By a unanimous vote of the European Community Council of Ministers, they have joined with us in some form of sanction imposition of the Soviets. It has not been as extensive as we would like. It has not been in the same area of commerce as we would like. But it did signify a sense of solidarity within the Western Alliance.

It amounts to a few hundred million dollars of trade from the Soviet Union to Western Europe, and I think we have to say, while again we would have appreciated more, we are pleased that they have gone that far.

Senator PELL. One followup point. I think I may have misheard you. In connection with the consultation question, did you say that the Congress was consulted before the June 18 decision was taken, or were notified within 1½ hours after?

Mr. **Olmer**. I said, within an hour and a half of the decision having been taken by the President, telephone calls were made to the staff of the Senate and the House.

Senator **Pell**. That was not my question. I said, did you consult? Consult means prior to doing it.

Mr. **Olmer**. Prior to the President having made the decision?

Senator **Pell**. Yes.

Mr. **Olmer**. We did not know what the decision was until he made it, Senator.

Senator **Mathias**. That is what we would like to have been in on.

Mr. **Olmer**. I do not think anybody here can deny our involvement in a series of conversations over time with the possibilities of the sanctions. I think I testified on this issue personally during the course of Secretary Buckley and my effort to engage the allies in credit negotiations. So it was not a mystery.

Senator **Pell**. I believe, and I am getting the citation now, that section (6)(4)(e) provides that in every possible instance the President shall consult with the Congress before imposing any export controls. My question to you is, Was there any consultation in accordance with the law before, not after?

Mr. **Olmer**. First, the President made the decision on June 18. The regulations were not promulgated in the Federal Register until June 22. A phone call was made between June 18 and June 22. So, technically, yes, there was at least the offer of consultations made, and in the case of the House they did get conducted.

Senator **Mathias**. I would come to Mr. Olmer's defense on this one point, that we did have hearings in this committee on the 3d of March which thoroughly explored the issue. So, while I am not sure a phone call after the President has made his decision is consultation, there was at least notice in advance.

Senator **Pell**. I would read the law. It says, "The President in every possible instance shall consult with the Congress before imposing any export control under this section." I gather where we might differ is, you feel that you did adequately consult with the Congress before.

Mr. **Olmer**. Well, there is a difference between a policy decision having been made and specific regulations being written and published to implement that policy. Export controls were not imposed until the 2d of June. Our offer of consultations was made on the 18th of June.

Senator **Pell**. After the President made his decision.

Mr. **Olmer**. But before the imposition of the controls.

Senator **Pell**. You know as well as I do this is quibbling. What is important is not the regulation. What is important is the decision, and the law refers to the decision, and you know that as well as I do, Mr. Olmer.

Senator **Mathias**. Perhaps we can agree to disagree on that point and move on, because we have another panel of witnesses. I have two more brief questions, but they go to the line of questioning that Senator Pell has followed with Secretary Buckley, and that is, are we going to affect decisions in the Kremlin, are we going to affect the Soviet Union? Secretary Buckley earlier used the phrase, are we going to hurt the Soviet Union? Now, is this really such a big deal from the Soviet point of view? What is the size of the pipeline construction projects that are presently contemplated in the Soviet Union?

Mr. BUCKLEY. 12,000 miles of wide pipeline. This is one of the most massive energy development projects ever undertaken by the Soviet Union, if not the most. It is essential to their program for the modernization of their industry and also to their program for the substitution of gas for oil so that they can export larger quantities of oil and increase their hard currency.

Senator MATHIAS. What percentage of their pipeline construction is now underway or in the planning stage? What percentage is represented by the Western European line?

Mr. BUCKLEY. 3,500 miles.

Mr. OLMER. Fifteen to twenty percent.

Senator MATHIAS. Something about 15 percent. So this represents only a limited part of their total system construction which is now underway.

Mr. BUCKLEY. No, Mr. Chairman, because in order to make substitutions and inefficient substitutions at that, they are going to have to shift compressors and turbines and so forth from their planned internal complex to substitute—to integrate into their export line, and given the inefficiencies of the economy, given the bottlenecks, given the breakdowns, the dislocation will be major.

Senator MATHIAS. I think that is something to ponder, given the size of this project.

Let me ask you one final question. We started out by talking about which ox is going to bleed the most. We have not talked much about the bleeding the Europeans are going to do other than the fact that they may lose some jobs, lose some business, incur some civil liabilities in this country, but the energy is important to them. They are heavily dependent on the Middle East for energy. You only have to read the press every morning to see what a volatile area that is, and how it may affect the reliability of energy supplies from the Middle East.

So, I think we can understand the concern of the Europeans for other energy sources. We say to them at the very least you are going to have to wait a couple of years longer than you thought you were for your Soviet natural gas. Go get other sources. Well, what other sources can we suggest to them?

Picking up Senator Percy's theme, that they could have all the Maryland coal they could use, but the fact is that we are not doing anything about improving our delivery system to make it possible to sell Maryland coal or Illinois coal. We are moving very slowly in that regard.

Then we say to them, go get Norwegian gas. The Norwegian foreign minister said recently that Norway cannot be an alternative source of gas to the Soviet Union from whence gas is scheduled to be delivered to Western Europe in the 1980's.

These are friends. They have a problem. Their problem is energy, and we say, well, you ought to get it over here. Do we not have some obligation to say, but you can get it from here or here or here? What do we do about this particular bleeding?

Mr. BUCKLEY. Mr. Chairman, I think we should make the distinction between the completion of an export pipeline and the date on which deliveries under a particular contract commence. We tried long and hard to persuade the Europeans not to commit to this particular pipeline, and we lost the argument, and in part because we were unable to come up with a plausible alternative source that would be competitive within a particular and narrow timeframe. I am not sure that we could not have done that if we had been able to concert our efforts and concentrate our thoughts more effectively.

But as I think I indicated in answering earlier questions, we anticipate that the Soviets will be delivering on schedule but at great cost to the Soviet Union. The Soviets have stated that they are going to do so. They have the capacity by diverting from their internal or Eastern European consumers, gas to Western Europe, perhaps not in those total quantities. We still are working to help persuade the Europeans that they should keep their commitments to the Soviet Union at a minimum, and we are working, as I indicated earlier, very diligently on plans for alternatives which would come into phase, we hope, later on in this decade.

There are possibilities in Algeria, Nigeria, and so on that could come on stream very rapidly, but in terms of the major thrust of your argument——

Senator MATHIAS. In that litany, do not forget Maryland.

Mr. BUCKLEY. And Maryland. And also, Mr. Olmer has sent a very well prepared mission to sell Maryland coal, and this is part of our strategy for offering reliable alternatives. But our European friends are not going to be deprived of the gas they need by virtue of these sanctions.

Mr. OLMER. I might add that we do have a major effort to increase coal exports from the United States, and we have, as Mr. Buckley points out, sent various missions to Europe. We will be sending another to South Asia come this fall. We will continue with the contacts that were made in Europe.

I might further note that if the Germans would reduce their import restrictions on coal, we would probably be able to sell them Maryland coal right now. That has nothing to do with port facilities being jammed or inadequate infrastructure in the United States, but their commitment to keep above water a noncompetitive dying industry.

Senator MATHIAS. Senator Percy.

The CHAIRMAN. I would like to follow up on Senator Mathias' questions on what the Soviets are doing now. How many gas pipelines does the Soviet Union have running from the Siberian fields to the western part of the Soviet Union or Eastern Europe?

Mr. OLMER. There are existing pipeline facilities, delivery facilities that do stretch into Czechoslovakia. I do not have a specific number for you, though, Senator. We can get that for the record, if you would like.

The CHAIRMAN. The Congressional Research Service study that we ordered, and you may want to check their accuracy, say that two pipelines are in place and six are under construction going from the East Siberian fields to the western part of the Soviet Union and Eastern Europe. At what level of capacity are they now running?

Mr. OLMER. The two that are in place?

The CHAIRMAN. Yes.

Mr. **Olmer**. I will have to get that answer for the record.

The **Chairman**. According to the information that I have, not only from that study but from also the manufacturers that have been involved, they are now underutilized. How easy would it be for the Soviets to increase their capacity in these other pipelines and divert some domestic gas and thus still deliver gas to Western Europe on schedule? I think, Secretary Buckley, you have stated the chances of materially delaying this are not very great.

Mr. **Buckley**. There is a distinction, Mr. Chairman, between delaying deliveries of a specific quantity of gas and completing a major pipeline that can very substantially increase your ability to export future gas at no cost to domestic consumers. There is a vast difference between those two propositions and on the impact on the Soviet Union and its economy.

The **Chairman**. But given the Soviet capacity for jury-rigging smaller turbines, purchasing them from Western Europe, do you really anticipate any real delays in the initial deliveries of gas?

Mr. **Buckley**. Not deliveries of gas, Mr. Chairman, but we anticipate delays over what is inherent anyway between 1 and 2 years. And to the extent that you have a 2-year delay and that the commitments to Western Europe are therefore met by gas that would otherwise be consumed in Eastern Europe as a substitute for oil, the cost to the Soviet Union in terms of forfeited oil sales revenues would be in the area of $400 to $800 million in that 2-year period. That is a very significant dent.

The **Chairman**. But look at the cost figures you have already given to us, that Secretary Olmer gave to us, to the United States for these sanctions. They exceed that. So do we not draw the conclusion that it really hurts us more than them? Ultimately, it is not going to have any real effect upon them. Do you have any doubt at all that they are going to finish this pipeline?

Mr. **Buckley**. I do not doubt that they will complete it, but we do not know, we cannot see into the future.

Mr. **Olmer**. Soviet planning called for two pipelines. It appears to us that it will be reduced now to one. That is not necessarily because of our actions, but for a variety of other considerations. We do not think we have the ability to force the forfeiture of Western European contracts, but we think by a variety of measures their demands will be reduced, their options in contracts they have signed to purchase reduced levels of gas may be exercised, and that the Soviet, when they begin earning money from deliveries of gas to Western Europe will indeed far exceed the suffering caused to U.S. businesses as a consequence of lost or foregone contracts.

I think my estimate was $300 to $600 million over the next 3 years to U.S. firms and another $1.6 billion over a 3-year period to foreign subsidiaries and licensees. That is over a 3-year period. And we are estimating annual earnings to the Soviet Union of between $8 to $12 billion from the sale of natural gas into Western Europe annually.

The **Chairman**. But again, do we think we are really going to stop them? I do not think any European country thinks it is going to be stopped. There may be some delay, but I think we can demonstrate that they can make up for that delay. They can jury rig, improvise, divert, and they would begin on schedule.

I feel it is a national challenge now. In other words, our allies in Europe are now determined to work with the Soviet Union to prove the United States cannot dictate to them a policy that they feel is a sovereign national policy and their national right.

Mr. BUCKLEY. Nonetheless, Mr. Chairman, the pipeline, if completed, will be far less efficient, and it will be completed only at the cost of major disruptions of their programs for the other 9,000 miles of internal distribution.

The CHAIRMAN. It is amazing what they are willing to put up with if they really feel their national honor and sovereignty is being challenged. And now to have them cooperate fully with our European allies in overcoming and overturning—I think if you make a mistake, you had better correct it as fast as you can.

You know, that board of directors at Ford could have still been making the Edsel, seeking to, in principle, say, if we think this car is good, the American public had better buy it. Well, they just did not. They said the policy was a mistake. They were smart about it, and we must, I think, recognize we tried, we tried very hard. But we have also concluded as a matter of principle at the highest levels, the President of the United States, that sanctions imposed without cooperation and support of our allies are ineffective. We know that. We know this sanction is not effective.

Let me turn to testimony given before this committee last year by one of the most respected figures in the State Department today, Arthur Burns. I asked him about the pipeline at that time. He said this: "My own view, first of all, is that this"—that is, the pipeline—"is a problem for the Federal Republic to decide. We as friends can express our views, but it is that country's decision and not ours."

Further, he said, "Senator, since my youth, I have always believed in a liberal commercial policy. As the years have gone by, I have acquired the feeling that our State Department, which I am now joining, has not been sufficiently vigilant in protecting the interest of American business. If this committee and the Senate should see fit to confirm my nomination, I will assure you I will do everything I can to protect and promote the legitimate interests of American business. As to your specific question, I do not see any reason in the world why American manufacturers should not place bids on equipment of a similar sort that the Soviets could acquire from the Japanese or other sources."

Ambassador Burns was recently in the United States. Did the State Department update themselves as to his current thinking on this particular matter? And will they take into account the advice and counsel of one of the wisest men who has ever served the U.S. Government?

Mr. BUCKLEY. He is a very wise man, and very careful attention is paid to his counsel.

The CHAIRMAN. And was he consulted when he was back here on this particular issue?

Mr. BUCKLEY. I am not in a position to disclose the nature of the conversations. But he had extensive discussions with the Secretary and the Deputy Secretary. I spoke to him, and people throughout the administration.

The CHAIRMAN. I would like to say, in conclusion, that this panel's testimony, I feel for them, I think they have fought hard for a case. But I do not think it is a very good case, but you have done a good job with it. And I want you to know that we have taken seriously the President's position.

I would note, however, that we should not, under any condition, be subsidizing the Soviet economy. I have met and talked with leaders in every European country to be certain that they understand that we support the fact that the President believes, and we believe, that they should not be offering concessional credit terms, they ought not to be subsidizing it. The Soviet Union is a developed country, not a developing nation. And the Europeans should therefore be imposing credit terms that are market rates.

We concur completely that they ought to explore, and I have urged every European country to explore every possible alternate source of energy in their own interest and not become overly reliant on it. So we have found areas where we concurred. We worked together. We concurred completely on doing everything we conceivably can to be effective on the Polish situation.

But I again come back to the question, is it effective? And the President was absolutely right when he said, we are not having an effect if we cannot be supported by our allies. An embargo, a sanction, to be effective has to be effective across the board. If it is not, we are again hurting ourselves.

The economy is the strength of this country today, and if we keep undercutting our own economy, weakening our economy, strengthening others' and not having any adverse effect on the Soviet Union, I just do not think it is a policy that will stand up to the light of day.

I hope it will be reconsidered by the administration, and I hope for an honest assessment, as the President many times has honestly looked at something and said, look, the facts just are not there, the conditions that we thought would exist, and therefore, reluctantly, we are going to adjust to the situation, hope for the best, but look out for the U.S. interests in this regard. And I am afraid we just simply are not. Thank you.

Senator MATHIAS. Senator Pell.

Senator PELL. Thank you, Mr. Chairman.

I think Secretary Buckley knows the affectionate regard I have for him, and he is certainly an able advocate, and I admire him and am a colleague of his.

I just wanted to be on record that I think that the sanctions policy is a stupid mistake, ineffective, and, I trust, will be reversed.

Mr. BUCKLEY. Thank you, Senator.

Senator MATHIAS. Your message is clear, Senator. [Laughter.]

Did you want to respond?

Mr. BUCKLEY. We recognize that there is not unanimous support.

Senator MATHIAS. Well, the committee has to continue to pursue this question. We will now have a panel of representatives from the private sector who, I hope will help us to make that judgment of which ox is bleeding the most. Thank you very much.

We are glad to have as witnesses on our second panel: Mr. Hugh P. Donaghue, vice president of Control Data Corp., Mr. Edward A. Hewett, senior economist in the Brookings Institution; Mr. Julius

Katz, managing director of ACLI International; and Mr. Michael Wright, the chairman and chief executive officer of Cameron Iron Works. We will ask all four to come to the table at one time.

Gentlemen, I believe each of your have statements. Let me invite you to submit those statements for the record, where they will appear in full, and to summarize your position as briefly as possible. And then we can get to some discussion of this important subject. Do you have a preference as to how you will proceed?

[No response.]

Senator Mathias. We can start with Mr. Donaghue and go right down the table.

## STATEMENT OF HUGH P. DONAGHUE, VICE PRESIDENT, CONTROL DATA CORP, WASHINGTON, D.C.

Mr. Donaghue. Mr. Chairman, Senator Percy, I am pleased to appear before this subcommittee. My name is Hugh Donaghue, and I am vice president of government programs and international trade relations for Control Data Corp. But today I appear as a spokesman for the U.S. Council for International Business, an organization which represents the interests of its 250 corporate clients on issues affecting international trade and investment.

The U.S. Council is one of the major business associations that concentrates solely on the international marketplace and serves as the national affiliate of the International Chamber of Commerce.

As a major spokesman for the U.S. business community, the council has long been interested in questions regarding East-West trade. We have carefully followed the policy changes which have taken place from year to year and are discouraged by the lack of a clear, consistent, and predictable economic policy with the Soviet Union and Eastern Europe.

We recognize that U.S. trade policy with the East is, by definition, unique, and that our overall economic relationship with the Soviet bloc cannot be divorced from the broader political security objectives. However, we are convinced that trade sanctions do not contribute to the realization of these objectives. Further, the U.S. Council believes that unilaterally imposed sanctions simply divert export sales to our competitors without really having any effect on Soviet behavior.

You are aware, Mr. Chairman, of the numerious instances where the sudden tightening of Government-imposed export controls has caused U.S. contracts to be lost to foreign competitors. Although regrettable, it is certainly understandable that potential buyers are not willing to risk their supplies being cut off every time Washington wishes to send a signal to the Soviets.

Commercial reliability in the world marketplace is an objective for which U.S. companies have long labored, and it is grossly misleading to think that we can easily win it back when the sanctions are lifted. Even the most experienced and optimistic businessmen recognizes the difficulty with which lost markets are recovered, and in the case of Eastern Europe, it is nearly impossible.

It is also unrealistic tc cling to the romantic view that withholding American technology will seriously cripple the Russians. Indeed, the existence of alternative suppliers and their willingness to sell to the Russians completely undermines the effectiveness of unilaterally imposed export controls on commercial products.

The administration is keenly aware that there are only a few selected areas where we alone can limit the Communist countries' access to major products and technologies. Even if we could get European governments to agree to withhold vital technology—and there is really little reason to believe that we would—it is by no means clear that trade sanctions would be effective.

What needs to be recognized is that economic sanctions generally have little effect on the course of conduct of the Soviet Union. Furthermore, Washington's attempt to ban the use of American licensed technology for the Yamal pipeline drives a schism between our allies and undermines the very fabric of Western commercial relations.

Export sanctions have not had a record of success, either symbolically or substantively, and the U.S. Council believes that they should be avoided except in cases where our national security is under attack. We have witnessed too many instances where U.S. sales are sacrificed to the benefit of our competitors without any perceivable impact on Soviet economic or political behavior.

Against this background, why does the administration continue to press for trade sanctions? The argument is that the United States has grave concerns about European dependence on Soviet gas supplies. In addition, there was concern that European hard-currency reserves flowing into the Soviet Union would be used to strengthen the Soviet military and that Western Europe is indirectly then financing Soviet expansionism.

The imposition of martial law in Poland is another reason for the administration's response. All of these are legitimate concerns, ones that need to be addressed. But it is our belief that unilateral trade sanctions just exacerbate the political difficulties in the Western alliance at a time when our real needs require that we cooperate more fully through contingency planning.

The U.S. Council urges that the administration carefully reconsider its position regarding the pipeline. We feel that the recent decision by the administration to assert extraterritorial jurisdiction over subsidiaries and licensees of U.S. companies in Europe represents a triumph of ideology over commonsense. Current efforts to delay the pipeline have damaged our relations with the Europeans, deprived American businessmen of overseas opportunities, and have had little, if any, effect on the pipeline, which will undoubtedly be built in any event.

When the United States goes beyond limiting the export of its own goods to forbid the sale of goods produced overseas by U.S. subsidiaries or licensees, it is engaging in extraterritorial application of U.S. laws and aggravating an already strained alliance. The U.S. Council for International Business calls upon the administration to take another hard look at the consequences of its East-West trade policy. We believe that there are important economic considerations that need to be weighed against the above-mentioned politico-security concerns.

The extraterritoriality issue, in particular, has important ramifications for our overall international trade policy. It is critical that we develop a multilateral consensus in the export control and credit areas if our efforts to influence Soviet behavior are to enjoy even a modest degree of success. Otherwise, we sacrifice markets to our competitors, create unnecessary strain in our Western alliance, and invite retaliation by our trading partners—all this, Mr. Chairman, with little to show for our efforts. Thank you for allowing me the opportunity to present the views of the U.S. Council before your committee.

[Mr. Donaghue's prepared statement follows:]

### PREPARED STATEMENT OF HUGH P. DONAGHUE

Mr. Chairman and distinguished members, I am pleased to appear before the Subcommittee on International Economic Policy to comment on the trade and foreign policy implications of the Administration's recent efforts to regulate East-West trade. My name is Hugh Donaghue and I am Vice President, Government Programs and International Trade Relations for the Control Data Corporation.

I appear today as spokesman for the United States Council for International Business, an organization which represents the interests of its 250 corporate clients on issues affecting international trade and investment. The U.S. Council is one of the major business associations that concentrates solely on the international marketplace, and serves as the national affiliate of the International Chamber of Commerce (ICC). The ICC works in an advisory capacity with a wide range of intergovernmental institutions such as the United Nations, the General Agreement on Tariffs and Trade (GATT), the International Monetary Fund (IMF), the Organization for Economic Cooperation and Development (OECD), and the European Community (EC).

As a major spokesman for the U.S. international business community, the U.S. Council has long been involved in questions regarding East-West trade. We have carefully followed the policy changes which have taken place from year to year, and are discouraged by the lack of a clear, consistent and predictable economic policy with the Soviet Union and its associated states. We recognize that U.S. trade policy with the East is by definition unique, and that our overall economic relationship with the Soviet bloc cannot be divorced from broader political-security objectives.

However, we are convinced that trade sanctions do not contribute to the realization of these objectives. Further, the U.S. Council believes that unilaterally-imposed sanctions simply divert export sales to our competitors without having any real effect on Soviet behavior.

You are doubtless aware, Mr. Chairman, of the numerous instances where the sudden tightening of government-imposed export controls has caused U.S. contracts to be lost to foreign competitors. Although regrettable, it is certainly understandable that potential buyers are not willing to risk their supplies being cut off every time Washington wishes to "send a signal" to the Soviets. Commercial reliability in the world marketplace is an objective for which U.S. companies have long labored, and it is grossly misleading to think that we can easily win it back when the sanctions are lifted. Even the most experienced and optimistic businessman recognizes the difficulty with which lost markets are recovered, and in the case of Eastern Europe, it is nearly impossible.

It is unrealistic to cling to the romantic view that withholding American technology will seriously cripple the Russians. Indeed, the existence of alternative suppliers, and their willingness to sell to the Russians, completely undermines the effectiveness of unilaterally imposed export controls on commercial products. The Administration is keenly aware that there are only a select few areas where we alone can limit the Communist countries' access to major products and technologies. Even if we could get European Governments to agree to withhold vital technology, and there is little reason to believe they would, it is by no means clear that trade sanctions would be effective. What needs to be recognized is that economic sanctions generally have little effect on the course of conduct of the U.S.S.R. Furthermore, Washington's attempt to ban the use of American licensed technology for use on the Yamal pipeline drives a schism between Allies, and undermines the very fabric of western commercial relations.

Export sanctions have not had a record of success, either symbolically or substantively, and the U.S. Council believes that they should be avoided except in clear cases where our national security is under attack. We have witnessed too many instances where U.S. sales were sacrificed to the benefit of our competitors without any perceivable impact on Soviet economic or political behavior.

In the final analysis, if the President decides that economic sanctions are necessary to protect our national security, then the responsibility should be borne by all involved sectors, not just a select group of exporters. Further, if we expect sanctions to have any discernible impact on our adversaries' behavior, then we must ensure the support of our allies. Effectiveness in the use of any export control depends entirely on cooperation among the world's industrial countries. It is by no means evident that Western Europe or Japan or Canada or the newly industrialized countries would consider embargoes as anything but bad business. Their unwillingness to participate in trade sanctions makes U.S. unilateral action all the more impractical.

Against this background, why does the Administration continue to press for trade sanctions? The argument is that the United States has grave concerns about European dependence on Soviet gas supplies. In addition there is concern that European hard currency reserves flowing into the Soviet Union will be used to strengthen the Soviet military, and that Western Europe is indirectly financing Soviet expansionism. The imposition of martial law in Poland is another reason for Administration response. All these are legitimate concerns, ones that need to be addressed. But it is our belief that unilateral trade sanctions exacerbate political difficulties in the Western alliance at a time when our real needs require that we cooperate more fully through contingency planning.

The Europeans have already decided to go forward with the pipeline, and indeed are in most cases formally committed by contract to do so. The divisions that have resulted from U.S. efforts to block Western participation are reaching crisis proportions. We should consider this rift in the Western alliance in the broader context of an international trading system plagued by conflict and instability.

The U.S. Council urges that the Administration carefully reconsider its position regarding the pipeline. We feel that the recent decision by the Administration to assert extraterritorial jurisdiction over subsidiaries and licensees of U.S. companies in Europe represents a triumph of ideology over common sense. Current efforts to delay the Yamal pipeline have damaged our relations with the Europeans, deprived American businessmen of overseas opportunities, and have had little effect if any effect on the pipeline, which will be undoubtedly built in any event. When the United States goes beyond limiting the export of its own goods to forbid the sale of goods produced overseas by U.S. subsidiaries or licensees, it is engaging in extraterritorial application of U.S. laws, and aggravating an already-strained alliance.

Efforts to apply our regulations abroad will invite retaliation by the affected countries. France and Italy have announced defiance of the ban. Our closest allies are leveling harsh criticism at the Reagan Administration for applying U.S. laws to persons within their territories. There are additional harmful effects. As foreign buyers seek more reliable sources for technology, U.S. companies lose markets and become less willing to invest in research and development (R&D). R&D investment has fallen dramatically in recent years, and many U.S. companies are fast losing their technological advantage in world markets. The Reagan Administration's new element of control over foreign licensees forces buyers to seek alternative sources for technology, thus crippling U.S. initiative in R&D because foreigners no longer demand U.S. technology. In sum, it is not in our national interest to infringe on the sovereignty of our allies, block the use of industrial licenses, or order our subsidiaries to avoid selling.

The United States Council for International Business calls upon the Administration to take another hard look at the consequences of its East-West trade policy. We believe there are important economic considerations that need to be weighed against the above-mentioned politico-security concerns. The extraterritoriality issue, in particular, has important ramifications for our overall international trade policy. It is critical that we develop a multilateral consensus in the export control and credit areas if our efforts to influence Soviet behavior are to enjoy even a modest degree of success. Otherwise, we sacrifice markets to our competitors, create unnecessary strain in the Western alliance, and invite retaliation by our trading partners—all this, Mr. Chairman, with little to show for our efforts.

Thank you for allowing me the opportunity to present the views of the U.S. Council before this distinguished group.

Senator Mathias. Thank you, Mr. Donaghue.

Mr. Hewett.

## STATEMENT OF EDWARD A. HEWETT, SENIOR FELLOW, THE BROOKINGS INSTITUTION, WASHINGTON, D.C.

Mr. HEWETT. Thank you, Mr. Chairman, Senator Percy. My name is Ed A. Hewett. I am a specialist on the Soviet economy working at the Brookings Institution. I am currently writing a book on Soviet energy and Soviet foreign trade in energy. I speak here for myself and not for the Brookings Institution. My testimony is limited to the issue of how the embargo will affect the timetable for the construction of the pipeline and the timetable for deliveries of natural gas to Western Europe. I will summarize my prepared statement.

This pipeline involves a maze of agreements covering finance equipment exports, and the shipment of the gas itself. And although it is called a gas for pipe steel, it is not. Actually it is a set of separate agreements, and the collapse of one set of agreements still leaves the others in effect.

The agreements call for the exportation of about $5 to $6 billion in equipment from Europe to the Soviet Union in the next 3 years. Then they call for gas purchases beginning in 1984 and going on to the end of this century. Currently, the Soviet Union exports to Western Europe 27 billion cubic meters of natural gas. Under the agreements that are being reached now on gas purchases from the Soviet Union, that figure would rise to about 60 billion cubic meters.

I should caution you, by the way, when the administration talks about a figure of $8 to $10 billion in proceeds from gas exports, they are talking about earnings on all gas exports and not just on the new gas exports. And indeed, anything we do in our policy in the near future will not affect the 27 billion cubic meters, most likely, but will affect only a portion of the earnings they are discussing.

My conclusion, outlined in the testimony, is that it is not likely the embargo will impose a significant delay either on the construction of the pipeline or on the gas deliveries. My approach here is to sketch out the options available to Europe and to the Soviet Union for circumventing the embargo, both the December 29 embargo and the embargo of June 18 of this year.

The original agreements foresaw on the part of the Soviet Union and Europe an optimal configuration of the equipment; that is, the best configuration they could come up with, which for the Soviets meant new high-powered 25-megawatt GE-based turbines, and for Europe meant the construction of those turbines but with reliance on GE for some of the parts.

The U.S. sanctions have certainly frustrated those plans and put them into some doubt. The question now is whether Europe and the Soviet Union can find not an optimal, but an acceptable, way to build this pipeline and supply the natural gas. Therefore, the question really is, Can they make do? I think they can.

Let me briefly summarize the problem that we have created for the Europeans and the Soviets. It has to do mostly with the turbines which are used to drive the compressors, which are used to move the gas through the pipeline. The current contracts call for John Brown in United Kingdom, Nuovo Pignone in Italy, and

AEG-Kanis in Germany together to supply to the Soviet Union the 125 turbines which are needed for the gas pipeline. Under those contracts these firms were to receive from General Electric the rotors and the blades, which are the core of the turbine.

In addition, Alsthom Atlantique, a French firm, has a contract in force which was concluded before September 29, to supply 40 rotors and blades which were to be used as spares, or in further pipeline construction in the Soviet Union.

The December 29 sanctions nullified the GE portion of those contracts and therefore created a problem for the French, Italian, the German, and English firms. The June 18 sanctions have essentially tried to stop the entire deal; that is, tried to stop the exports of all of the compressors with or without GE blades and rotors.

Let me briefly now talk about the way that the Europeans and the Soviets might be able to get around the sanctions. There are basically two ways they could do it. One of them is what I will call the all-European solution, and the other, an all-Soviet solution.

In the all-European solution, European firms supply all the technology for the pipeline. By far, the most preferable version of this solution would be for European firms to somehow replace the lost shipments from General Electric and the fulfill existing contracts. Technically, this is feasible. We no longer have a monopoly even on the blade and rotor technology because GE sold all the licenses for that know-how to Alsthom Atlantique, and the Alsthom Atlantique is currently making the investments necessary to develop the capacity to produce the rotors and blades.

The question therefore is a political one. The question is whether European governments will order their firms—and in particular, whether the French Government will order Alsthom Atlantique—to engage in, to negotiate, and conclude a new contract on the blades and rotors.

So far, what the French Government has said is that Alsthom must meet its old contract for 40 blades and rotors. It has not, to my knowledge, said anything about a new contract, although I know the Soviets have appraoched Alsthom Atlantique, as have European firms, in an attempt to negotiate the new contract.

There is a subsidiary question of whether or not firms which are not directly under the control of their governments will decide to violate these sanctions and risk some of the civil penalties which were discussed this morning. But I suspect that is the less important question than the political one.

There are other variants of a European solution which the Soviets and the Europeans could explore and which the Soviets have, if anything, a considerable political impetus to explore, but they are not as likely to go through as the one I just discussed.

Second, there is the possibility of a Soviet solution. The Soviets have for a long time produced their own turbines, complete with Soviet blades and rotors. They have perfectly serviceable turbines in the 6- to 10-megawatt range. That is about half the size of the turbines we are talking about. They have experimental versions of a 25-megawatt turbine, which is apparently about as good as the GE turbine, and which is just going into production.

They are saying now in the press that they intend to build this pipeline with their own technology. I have a fair amount of familiarity with their technical capabilities in this and know something about the history of how new technologies entered the Soviet economy, and I really do not take this discussion seriously.

That is, I do not believe they can seriously hope to use their new 25- or 16-megawatt turbines on this pipeline. They can seriously hope on pipelines mid 1980's and late 1980's to use these turbines, but not now. We may see a few turbines of this construction on the line, but not many. That means that if they are going to go with their own technology, they really need to use smaller turbines which they produce and which they certainly have experience in using. On the other 56-inch lines they use these smaller turbines and could use them on this line.

The difficulty here—and here the administration is quite right—is that there are five other lines being built for which the small turbines are dedicated, and it would be difficult in a short period of time to come up with new turbines for a line of this length.

I might point out that this line is actually about 25 percent of all of their plans for producing large-diameter pipe in the Soviet Union. In kilometers they are laying 20,000 kilometers of 56-inch pipe in this 5-year period, of which 5,000 is for the new export line. The numbers the administration were giving you were actually for total pipeline construction of all sizes, not just for the large lines. So this is an important line.

Senator **Mathias**. So it is 20 percent of the large pipe, 12 percent of total pipe?

Mr. **Hewett**. Yes. Total pipe, they are planning to do 40,000 kilometers in 1981–85, large-diameter, 20,000.

I think it is likely that some variant of the European solution will probably evolve. The best case for the Soviets is either to conclude a contract with Alsthom Atlantique or the European firms to supply the missing blades and rotors.

If that does not work out because for some reason Alsthom decides not to go along, and there may be good reasons that they will not do so, then there are other solutions of a hybrid sort which the Soviets could pursue. There are already 23 blades and rotors in Europe which were shipped before the embargo. Alsthom is going to produce another 40.

The Soviets could therefore take delivery of 60 turbines of the 25-megawatt sort, put them on part of the line, and on the rest of the line either use smaller turbines of European construction, or else use smaller Soviet turbines, or even possibly a few of their new 25-megawatt turbines. If they did that, they could bring this line on approximately on time.

It is very unlikely they will try to rely totally on their own technology for this line while they simultaneously do it for the other lines. Somehow they are going to need some foreign technology for one of these six lines, and this one is a likely candidate.

If they are forced to rely solely on their own technology for this line and for the other five lines, then there will be delays in Soviet gas production, possibly in Soviet gas exports. But I think that is a very unlikely option. Thank your, Mr. Chairman.

[Mr. Hewett's prepared statement follows:]

## PREPARED STATEMENT OF EDWARD A. HEWETT

### I. THE CURRENT SITUATION

On December 29, 1981, the Administration instituted an embargo against exports by U.S. firms of oil and gas technology to the U.S.S.R. (as one of several sanctions responding to the imposition of martial law in Poland). On June 18, 1982, the embargo was extended to foreign subsidiaries of U.S. firms, and to foreign firms producing oil and gas equipment under U.S. license. The primary purpose of the sanctions is to delay, if not in fact halt, the construction of the gas pipeline planned to link the Urengoi fields in northwest Siberia with Western Europe. This testimony addresses the question of what real impact these sanctions are having, and are likely to have, on the construction of that gas line, and on the ability of the U.S.S.R. to meet the schedule for gas deliveries to Western Europe.

The U.S.S.R. now exports to Western Europe 27 bcm of natural gas. With the new pipeline and some slight increase in exports through existing capacity, that figure is scheduled to begin increasing in 1984, finally reaching about 60 bcm by 1987 or 1988. A large number of contracts (some of which are still under negotiation) are involved: those governing financing for Soviet equipment purchases, those governing actual equipment sales to the Soviets (some accompanied by supplier credits), and those governing Soviet gas sales to wholesalers in various European countries. The gas sales contracts are separate from the equipment sales and financing contracts, although some European governments have made it a de facto provision for signing a gas purchase contract that they see evidence of equipment contracts for firms in their country. The financing involves a mixture of official and private credits.

The U.S. sanctions only affect the equipment contracts, and there the primary impact is on contracts for 125 turbines produced under license from GE by Nuovo Pignone of Italy, John Brown of the United Kingdom, and AEG-Kanis of the Federal Republic of Germany. Each firm has a separate contract with GE in the United States to supply the blades and rotors for the units, since there was not, and as yet is not, any capacity in Europe to produce these critical components. Prior to the December 29 embargo GE shipped 23 rotor and blade sets to Europe, and should European firms choose to do so, this will allow them to ship to the Soviet Union up to 23 complete turbines.

Under a separate contract with the U.S.S.R. the French firm Alsthom Atlantique is committed to producing under GE license, and exporting to the U.S.S.R., 40 rotor and blade sets to be used as spares. Production and shipments of these is not scheduled to commence until early 1984.

The dilemma for European manufacturers of the turbines is that if they fulfill their current contracts with the U.S.S.R., they will be in violation of U.S. export regulations, which in turn will violate a portion of their license agreement with GE. In that situation the U.S. Government has threatened sanctions against the firms involved which could seriously affect their worldwide business interest. If, on the other hand, they choose to comply with the U.S. embargo they are, presumably, subject to large penalties payable to the U.S.S.R. for non-performance of contractual obligations. And their long-term relations with the U.S.S.R., a lucrative customer, could be adversely affected.

For European governments the issues are somewhat different. The U.S. administration is attempting to assert through the June 18th announcement the right of a country to control the use of its technology for foreign policy purposes, no matter where in the world that technology is being used. Even if European firms are inclined for their own reasons to acquiesce to United States wishes in this matter, European governments must consider the precedent which would be set allowing a government of a country from which a technology originates to control, for foreign policy purposes, the use of that technology anywhere in the world.

It is highly unlikely that European governments will willingly allow such a precedent to stand, especially on such an enormously visible set of agreements. It is increasingly clear in the wake of the June 18th announcement that the governments of France, England, Germany, and Italy are going to order, or at least encourage, their firms to do their best to fulfill the contracts they have concluded with the U.S.S.R. The balance of the sketchy public evidence available suggests that European firms and governments have, since last December 29, been engaged in an increasingly intense search for a "European solution" which would allow them to fulfill the existing contracts with the U.S.S.R. for the pipeline, relying solely on European productive capacity.

Although there is virtually no information available one way or the other, one suspects that the Soviet Union is being quite patient in waiting for the Europeans to find that "European solution." The Soviets cannot be happy at the prospect of a delay in the pipeline, especially if it is attributable to a successful U.S. embargo policy. Still they are surely willing to bear some delay if the final result is turbine imports from Europe since that would simultaneously relieve demand pressures on a hard-pressed Soviet turbine industry, while simultaneously giving the Soviets a political victory by successfully realizing a huge East-West trade deal in spite of the best efforts of the United States to stop the deal.

For an outsider it is extremely difficult to form an accurate impression of precisely what possibilities exist for Western Europe and the U.S.S.R. to frustrate the intentions of the U.S. embargo. There are technical, economic, and political unknowns; and the lack of detailed information on the discussions going on among European countries means that at times it is hard simply to list the unknowns, let alone to assess their relative importance.

Despite all of that, there is enough known to sketch out the most plausible alternative paths along which this situation might develop. There are two major possibilities. One is a "European solution," in which Europe and the U.S.S.R. agree on a way either to meet existing contracts, or to make new contracts which allow European firms to supply equipment for the pipeline. The second is a "Soviet solution" in which the Soviets cancel contracts with Europe and rely solely on Soviet technology to build the pipelines.

I will limit my discussion solely to the issue of turbines, and ignore questions concerning the 56-inch pipe. The United States has no influence over that part of the equipment, and shipments of pipe from Europe and Japan are proceeding normally. Furthermore any possible problems the Soviets may have in bringing this pipeline on stream will not involve the pipe or its timely installation. It is the compressor stations where potential bottlenecks can be found.

## II. THE EUROPEAN SOLUTION

The most likely form of this solution is where European governments and firms would choose, whether or not it was consistent with the U.S. embargo, to go ahead and produce GE-based turbines with rotors produced in Europe. Under this plan turbines would be delivered and installed pretty much on schedule. Some of them would have one of the 23 blade and rotor sets now in Europe in them; others would be shipped without the blade and rotor, and then that would be installed later at the compressor station location in the U.S.S.R. As Alsthom began to produce the forty blades and rotors originally involved as spares, those would immediately be shipped to the U.S.S.R. to go into the turbines needing those parts.

If Alsthom could speed up its current investment and production schedule so that blades and rotors began to come off their lines in, say, mid 1983 (and I have no idea if this is technically feasible, although there are hints to that effect in the press), and even if they produce at the anticipated rate of two blades and rotors per month, then by mid 1985 the Soviets would have up to 63 turbines in full operating condition (the 23 equipped with the GE blades and rotors, and the 40 equipped with Alsthom-produced blades and rotors). Since at any one time that line only needs to have approximately 40 of its turbines running (another 40 being in reserve, and the remainder in maintenance) then with luck the Soviets could have the capacity to run the line at full capacity by, say, the end of 1985. The "luck" involves the fact that with a maximum of 63 operating turbines available, some stations will only have one functional turbine. If it breaks down, then pressure in the line will fall somewhat. Given the well-known reliability of GE turbines, there is probably not even that much risk involved, at least for the first year or so of the operation of the line, which gives the Soviets more time to find more blades and rotors.

The remaining 60-odd blades and rotors, plus any spares, would seem most logically to come from an expansion of Alsthom's capacity to produce that equipment. Alsthom has all the necessary GE licenses, it is developing the requisite know-how, and it is in a position to reap whatever economies of scale might be involved. For all of these reasons, if Alsthom and the French Government are willing to face the possibility of U.S. economic retaliation, then Alsthom could provide the key link in an all-European solution to this problem.

If things worked as outlined here, there would probably be no important delays in the first years of deliveries of Soviet gas to Western Europe. New Soviet natural gas deliveries are scheduled to begin at low levels in 1984, rising at an unknown (but probably initially slow) rate to their level of something over 32 bcm by 1987 or 1988. Existing excess capacity in the export line from Orenburg to the Sovet border could handle the first 12 bcm of that commitment, so that the new Urengoi-West European line would not even have to begin operation until 1985. Even on the current production schedule for Alsthom's 40 turbine blades and rotors, that seems feasible.

Whether or not the Soviets could bring the line up to full capacity and keep it there from 1988 onward depends on whether Alsthom will accept commitments to produce the additional 60-odd blades and rotors. My guess is that the Soviets could manage the system so that even if the full complement of blades and rotors are not in place until 1987 or 1988, the system could still be kept at full flow.

So far the French Government has only ordered Alsthom to meet the existing contract for 40 rotors and blades, a contract which was signed before the December 29 sanctions were introduced. Although that order is in contravention to the U.S. embargo, it still would probably be regarded in the United States as a different and less severe violation, than if the French Government ordered Alsthom to accept new contracts for additional blades and rotors. It is, therefore, conceivable that Alsthom will not accept additional contracts. In that case, the only way this all-European solution would work would be for one or more firms in another country to build a plant capable of producing to GE specifications the needed blades and rotors. That could be a very expensive proposition, and a rather nasty engineering problem, both of which could mean far lengthier delays in the delivery of the rotors and blades. It would also make the costs of the blades and rotors higher, and thus probably change somewhat the economics of the project. It would seem therefore that if Alsthom will not go along with the all-European solution, this loses some of its appeal.

From the Soviet point of view the successful fulfillment of existing contracts is for them a very satisfactory outcome. They obtain the 25 MW turbines and will not need to redesign the compressor stations on the line, go through once again time-consuming negotiations, and so on. To be sure, it may be the late 1980's before they have enough turbines to have the line up to its optimal technical complement of turbines; but in the meantime they can exercise the finely honed Soviet talent for making do with much less than optimal.

If for some reason European firms decide they cannot, or will not, go through with existing contracts in contravention of the U.S. embargo, the Soviets may still try to renegotiate contracts based on non-U.S. technology. The most logical path here would probably be Rolls-Royce RB211 turbines, which were considered in the original negotiations for the line, then dropped by the Soviets in favor of the GE-based technology. There is no evidence either way on whether the Soviets are considering such an alternative other than the fact that they considered it once before. The major argument against this feasibility would seem to be the political one that it is difficult to imagine Mrs. Thatcher's government undertaking such a major project in direct conflict with deeply-felt U.S. policy goals.

It is also difficult to imagine the continental European turbine manufacturers easily giving up such lucrative contracts to the U.K. Therefore a second way Soviet and European negotiations might proceed is in terms of small turbines based on non-U.S. technology. My understanding is that there is an ample supply of such turbines (say in the 10 MW range), and the Soviets have a great deal of experience in using such turbines in their existing 56-inch lines. This option is inferior to using the 25 MW turbines both because of higher construction and installation costs (more turbines to be installed, and more buildings at the compressor stations), and also because of higher operating costs (less efficient per MW). Still, it is certainly a workable option.

Both of these variants of the all-European option are far inferior to going ahead with old contracts from the Soviet point of view, and probably from the European point of view as well. Therefore any exploration of such options would only follow after attempts to salvage the existing contracts failed.

## III. RELYING ON SOVIET-BUILT TECHNOLOGY

The Soviet press is now full of reports that their response to the Reagan embargo will be to rely on their own technology. Much prominence is given to the prototype of a 25 MW Soviet-designed turbine which is reportedly close to the point it can be put into serial production, and to a laminar 56-inch pipe up to, possibly exceeding, standards of pipe imported from Europe and Japan. There is also a 16 MW turbine which has been certified for serial production. And the Soviets have produced for some time acceptable turbines of smaller capacity (most of which are in the 6–10 MW range).

In fact it is very unlikely, despite all the high priority given to Soviet natural gas pipelines in the current Soviet five year plan, that they will be able to produce and successfully install by 1985 a large number of new large capacity turbines made in the U.S.S.R. We are more likley to see those turbines produced and installed in large numbers in the latter part of the 1980's (although some may be put into the West European export line). Therefore to rely on domestic technology for the new export line they would have to mainly use their smaller turbines. But the difficulty there is that those turbines are probably already fully dedicated to the other five domestic natural gas lines now under construction, and those lines are an important part of the energy plan which could not be easily sacrificed in favor of an export line. It might be possible to increase production of domestic turbines of small capacity, or divert them from elsewhere, but the industrial system is strained enough now, and this seems a difficult maneuver for the Soviets to pull off.

I take much of the Soviet discussion of their ability to "go it alone" as a combination of some justifiable pride in their considerable accomplishments to date in bringing on stream new natural gas transportation capacity, relying partly on Soviet equipment, and a liberal dose of hope that they can set new records in bringing new technology into serial production. Any serious Soviet planner probably would much prefer that the existing contracts with Western Europe go through, so that he needn't find out if indeed those new records can be actually set.

### IV. A CONJECTURE ABOUT THE FUTURE OF THE SOVIET-WEST EUROPEAN GAS PIPELINE

Any prudent European or Soviet planners would probably tend to place a rather high probability on the maintenance by the United States of the embargo announced December 29 of last year. Thus—irrespective of what happens to the June 18 extension—European governments and firms must find an all-European solution to the equipment side of the natural gas pipeline; if they cannot agree among themselves and with the Soviets on such a solution, then the Soviets will have no choice but to try to rely on their own technology.

I think it is likely that a combination of Soviet ingenuity and West European political determination will generate a solution along the lines of existing contracts, probably with a dominant role for Alsthom.

One real possibility here is a technologically hybrid solution in which the Soviets buy all the 25 MW turbines they can under existing contracts (Alsthom is the constraint here, so this probably means 63 turbines), and installs those in twenty stations. In the remaining stations they put in whatever Soviet-built 25 MW turbines are available, and the remaining stations are redesigned to take eight of the Soviet-built 10 MW turbines.

Whatever happens here, it is quite likely that the Soviets will be able to begin gas deliveries on time; they have sufficient capacity to do that right now, and the only issue is when transit capacity through Czechoslovakia and Hungary will be ready. If the negotiations with Alsthom run into difficulties and the rotors and blades are shipped at a very slow pace, or the hybrid solution is followed, there may be some difficulty in bringing the line up to full capacity on schedule. But there seems to be enough slack in this agreement (particularly now that West European countries are revising downward the projected path of energy demand in this decade) that it is doubtful Soviet deliveries will be far off schedule. It is therefore unlikely that the U.S. embargo will in itself be responsible for significant delays in the construction of the Soviet-West European line, and the deliveries of gas through it.

The only way significant delays would develop is if Alsthom is unwilling to accept contracts for more rotors, and other European firms will not or cannot undertake the responsibility of building the requisite new capacity to produce GE-type blades and rotors. In that case the Soviets are either forced into a new round of negotiations and project design, or into a heavier reliance on their own technology, and either path could result in substantial delays.

Senator MATHIAS. Thank you, Mr. Hewett.
Mr. Katz.

## STATEMENT OF JULIUS L. KATZ, MANAGING DIRECTOR, ACLI INTERNATIONAL, INC., WHITE PLAINS, N.Y.

Mr. KATZ. Thank you, Mr. Chairman. I appreciate your invitation to participate in your committee's consideration of the trade and foreign policy implications of expanded U.S. export controls aimed at the Soviet gas pipeline to Western Europe. Mr. Chairman, I am appearing in a personal capacity as a former official of the State Department. The views I express are my own and not necessarily those of my company.

Senator MATHIAS. They will be no less valid.

Mr. KATZ. Thank you, sir. I will summarize my statement and request that all of it be inserted in the record.

Senator MATHIAS. Your full statement will appear in the record.

Mr. KATZ. Thank you, sir. We have had long experience with export controls imposed for foreign policy reasons. There have been a number of cases in recent years. And experience has shown that such controls are political statements rather than effective instruments of economic denial or political pressure. The reason, very simply, is that we do not, except in limited circumstances, have effective unilateral controls over goods or technology. And except for truly strategic goods and technology, our friends and allies have rarely been prepared to join with us in imposing economic controls for political ends.

The effect of U.S. controls under such circumstances is to cause some inconvenience and a need to reorient supply lines, particularly at the outset when controls are imposed. This is not true, however, of American producers who do not suffer permanent losses of markets to foreign competitors. There is a tendency in considering controls of this kind to overstate the impact on the embargoed country and to understate the cost to American producers and workers. And I think that question was well ventilated this morning.

It is one thing for the United States to engage in acts of economic self-denial for policy reasons, but the costs of such policies are greatly compounded when we seek unilaterally and retroactively to impose our policies on other countries. Such controls can be thwarted but American trade and investment interests in friendly nontargeted countries are seriously and permanently damaged.

The issue at stake here, to my mind, is very simply that of the reliability and the constancy of the United States as a trading partner. We have not yet fully recovered from the effects of the soybean embargo of 1973. Prior to this event, it was unthinkable for the United States to nullify contracts with friendly countries. In the aftermath of that embargo and with increasingly frequent resort to export controls since then for motives other than those of true national security reasons, we have undermined the trading and investment posture of the United States.

The action with respect to the Soviet gas pipeline is a further damaging blow to our export and foreign economic policy interests. Thank you, Mr. Chairman.

[Mr. Katz' prepared statement follows:]

## PREPARED STATEMENT OF JULIUS L. KATZ

Mr. Chairman: Thank you for the invitation to participate in your Committee's consideration of the trade and foreign policy implications of expanded U.S. export controls aimed at the Soviet gas pipeline to Western Europe.

Actions by the Administration to deny U.S. equipment and technology for the Soviet gas pipeline is but the latest attempt to employ export controls for foreign policy reasons. Other examples in recent memory include the Afghanistan grain embargo, embargoes against Cuba and Rhodesia, and various export limitations enforced to support U.S. policies with respect to South Africa, nuclear non-proliferation and human rights to mention just a few. What is common to these restrictive export measures is that they constitute more of a political statement than an effective instrument of economic denial or political pressure.

The reason for the ineffectiveness of export denial measures is not hard to discern. Except for highly sophisticated weaponry, it is rare that the United States has effective unilateral control over goods or technology. And, except for items truly considered as strategic, few of our friends or allies have been prepared to join with us in imposing economic controls for political ends.

Thus, export controls may produce relatively minor inconveniences and at times some increased costs to the targeted country, particularly at the outset when alternative supplies need to be arranged. As supply lines are reoriented, however, the impact of the controls quickly disappear. This may not be true however of U.S. producers who suffer a permanent loss of market to foreign competitors.

The economic impact of export controls on the U.S. economy is rarely given weight in deciding to impose trade controls. As exception to this recently has been the Reagan Administration's lifting of the grain embargo and exemption of grain trade from association with the measures taken in connection with imposition of Polish martial law. But in general, the government seems quite ready to overlook and even sacrifice the interests of individual manufacturers and groups of workers for supposed foreign policy benefits.

While the resort to export controls for foreign policy reasons has been, in my view, all too frequent, there have been fewer examples of the kind of extraterritorial extension we have seen in the Russian Soviet gas pipeline project. There have been serious disputes in the past with France and Canada over extraterritorial applications of China controls and Cuban controls but I do not recall an instance when we have sought to impose a unilateral policy decision against virtually all of our major allies simultaneously. I believe that this course is misguided and that it risks seriously adverse consequences for U.S. foreign economic policy interests.

It is one thing for the United States to engage in acts of self-denial for policy reasons. But the costs of such policies are greatly compounded when we seek unilaterally and retroactively to impose our policies on other countries. Such extension of controls can be easily thwarted, but U.S. trade and investment interest in friendly, nontargeted countries are seriously and permanently damaged. Canadian nationalists regularly cite extraterritorial application of U.S. policies as a reason for opposing majority ownership of Canadian industry by American investors. A similar attitude is found in France and these arguments against the American presence will be strengthened by this latest example of U.S. unilateralism.

There is a further issue at stake here and that is simply the reliability and constancy of the United States as a trading partner. We have not yet fully recovered from the effects of the soybean embargo of 1973. Prior to this event it was unthinkable for the United States to nullify trade contracts with friendly countries. In the aftermath of that embargo and with the increasingly frequent resort to export controls since then for motives other than true national security reasons, we have undermined the trading and investment posture of the United States. The Soviet gas pipeline affair is a further damaging blow to our export and foreing economic policy interests.

Thank you, Mr. Chairman.

Senator MATHIAS. Thank you, Mr. Katz.

Mr. Wright, I see that you are accompanied this morning by Mr. Downey, who was with us in March when we began this dialog, and we are glad to have him back today.

## STATEMENT OF M. A. WRIGHT, CHAIRMAN AND CHIEF EXECUTIVE OFFICER, CAMERON IRON WORKS, HOUSTON, TEX., ACCOMPANIED BY ARTHUR T. DOWNEY, CHAIRMAN, TASK FORCE ON TRADE WITH NONMARKET ECONOMIES, AND DONALD J. HASFURTHER, DIRECTOR FOR EAST-WEST TRADE

Mr. WRIGHT. That saves me an introduction on my part. We are glad to have him, too. I also have with me, sitting right behind me, Donald J. Hasfurther, who is the director of East-West trade for the U.S. Chamber. In this appearance I do bring you a certain amount of personal experience in international business. Before joining the chamber in 1977 I retired from Exxon after 43 years of service, much of it in executive positions which involved foreign operations. However, I appear before you representing the U.S.

Chamber and, to some degree representing Cameron Iron Works, with whom I have served the past 5 years, as chief executive officer.

I am pleased that you have seen fit to call hearings regarding the June 18 Presidential statement which was expanded on oil and gas equipment export controls and have given me the opportunity to testify on behalf of the chamber on this subject.

As you are aware, the chamber is the world's largest business association, with a membership of over 250,000 small, medium, and large businesses and trade and professional associations. The chamber has a long history of interest in foreign policy, and this is outlined in my prepared remarks which I submitted.

In recent months the chamber has communicated numerous times with the appropriate legislative and administrative officials its views regarding foreign policy export controls. And this is to be found also in my prepared remarks. You will find in those attachments a continuing support for trade sanctions for legitimate national security, but concern over unilateral export controls imposed for foreign policy purposes when these controls succeed only in penalizing the U.S. exporter.

Now, that brings me to June 18. On that day U.S. Chamber President Lesher released a letter to White House officials on this subject. And I recommend it for your reading.

Again, on June 18, the White House released a statement by the President with which you are all acquainted. On July 14 President Lesher communicated with the White House again on the subject, and I would just like to give you one paragraph of this because it is, I think, very appropriate.

After indicating the chamber's support in a broad way, he said, "Moreover, we support your efforts to tighten controls over the export of militarily critical goods and technology to the Soviet Union and to curb the subsidization of export credits to the Soviets. However, the Chamber of Commerce views with concern the decision to extend unilaterally U.S. export controls over oil and gas equipment and technology, including but not limited to that bound for construction of the Yamal pipeline on an extraterritorial and retroactive basis. The unprecedented blanket prohibition over U.S. subsidiaries and affiliates and control of previously licensed U.S. technology pose serious questions, considering the present direction of the U.S. international economic policy. This action has ramifications that go well beyond America's trade relations with the Soviet Union."

Now, I think most of the attention regarding this order of June 18, has been centered on the pipeline itself. And, of course, this has been a controversial subject for a number of years. And few outside knowledgeable people in Washington, I would say, fully realize that the June 18 order is so broad as to affect a much wider range of products and equipment which have no relationship with the pipeline itself. And in particular, I am speaking of oil and gas well equipment which is used in the drilling and producing of oil and gas wells.

This concludes my verbal introductory statement. However, with your permission, I would like to give you a brief story of what my own company has suffered under the June 18 Presidential sanctions, as your pleasure.

Senator MATHIAS. Why do you not give us that right now? I think that is pertinent to the question we have asked as to which ox is bleeding the most.

Mr. WRIGHT. I think this might be helpful. Cameron Iron Works was organized as a Texas corporation in 1920. It is a Houston-based vertically integrated international steel company but is engaged in the design, manufacture, and marketing of a broad range of oil tools, ball valves, and forged steel products. Our total sales run approximately $1 billion a year, our net profits on the order of $100 million. Approximately 70 percent of our sales are control equipment for oil and gas well drilling and production.

All of this is essentially located on the rig floor of wells as they are drilled and put into production. Now, 60 percent of our sales are abroad. We have melting and forging facilities in the United States and in Scotland, and we have major manufacturing plants in Scotland, England, France, Germany, Singapore, and Mexico.

Over the years past, Cameron has delivered a considerable amount of equipment to the Soviets from the United States and from our subsidiaries in Western Europe and the United Kingdom. The special licensing procedures that were set up by the Carter administration on August 1, 1978, were strictly followed. We were cleared for exportation to the Soviets because of our success in demonstrating that the Soviets could obtain similar equipment from a great many other sources. Therefore, we were granted export permits as a competitive means.

The Reagan administration policy—the change that came about on December 29, 1981—allowed business to be conducted with the Soviets only by foreign subsidiaries with the provision that the products, one, did not contain any U.S.-origin material; and two, did not contain any U.S.-manufactured components; and three, were not manufactured using U.S. technology exported to the foreign subsidiary or licensee after August 1, 1978. I am speaking of all of the technology being over 4 years old. And Cameron has conformed strictly to these rules.

Now, under the provision of these rules, we have competed aggressively against U.S. and foreign companies for Soviet business. And in March of this year we were successful in obtaining Soviet orders for oil and gas well drilling and production control equipment totaling $100 million. None of this equipment is associated with the pipeline. The wells for which this equipment was ordered would not even furnish gas to the pipeline when it is completed.

The President's Soviet sanction order on June 18 prohibits the export of oil and gas equipment by U.S. foreign subsidiaries. Now, this became effective approximately 2½ months after we had received our March orders from the Soviet. The Soviet orders provide for deliveries to start in July 1982. Today is July 30. Our deliveries were to start in July and continue through April of 1983.

Since receiving the orders, we, as you would anticipate, have been working diligently toward fulfilling these terms. We have forged all of the large blowout preventer bodies in Scotland, and they are now either in our plants on the continent or enroute in movement or still being boxed for shipping.

Our manufacturing plants in France and in Germany have been geared up to maximum capacity. Subcontractors have been committed for certain components. Inventories have been substantially increased. And the work forces have been expanded. A large amount of money has already been spent, and more is committed.

Now, if we fail to deliver, the Soviets have alternate suppliers. We keep very close track of our competition in this area. According to our information, the capability to manufacture acceptable equipment under three categories are this:

First, the three types of equipment are blowout preventers. These are large steel ram-type preventers to control oil wells in case of accidents when they get out of control. We have another type of preventer called an annular preventer that, generally speaking, is for very much the same purpose. So these are blowout preventers to keep wells in control in case of accidents.

We also have wellhead equipment, and this is a combination of valves and supports which are known in the industry as Christmas trees. They control the rate at which wells are produced and have the ability to shut them in at any time.

And the third category is gate valves. And these are the components of the wellhead equipment essentially, but they come as a separate item.

All right. When you look at the capability for other people to manufacture acceptable equipment—this is not saying that it is necessarily good, as we think ours is—but it is acceptable because we compete with it for the business with these people for blowout preventers: Japan, Romania, Canada, Germany, Norway, and France. On wellhead equipment, Japan, Romania, Canada, Yugoslavia, Austria, Argentina, and Brazil. For gate valves, Japan, England, Scotland, Austria, Yugoslavia, Italy, Mexico, Argentina, and Brazil.

Therefore, for us to fail as a supplier does not deny the Soviets the equipment. It only denies us the sale. And further, of course, if we fail to deliver, it will not only destroy the confidence of the Soviets in us as a supplier, but it will build up the strength of our foreign competitors.

Both of these factors would greatly affect our future. Expanded foreign competitors will have a preferential position with the Soviets and at the same time be in a considerably improved position to compete with us in the United States as well as abroad.

And not a minor financial problem in this whole thing is that if we fail to deliver, we will be faced with substantial cancellation charges.

We and others like us, face agonizing legal, ethical, and business problems. We organized our subsidiary in the United Kingdom September 1, 1955, in France in 1958, in Germany in 1963. We have been good corporate citizens for these host countries. We have identified ourselves with them and have benefited greatly over the years from this wholesome relationship. And the United States has also benefited from our success.

But now we are faced with an administrative order which unfortunately and perhaps unintentionally has caught us up in a much broader issue. As you must be well aware, the administration order in the minds of the host countries runs contrary to their national interests. There are also opinions, of course, that the order is of questionable legality.

But be this as it may, we are also working on such a short term time frame that we are not afforded the luxury of waiting for months and months for the administration to negotiate agreements with these host countries.

In all probability, either the Soviets will cancel our order for nondelivery or our host countries will make decisions that will put us at odds with either them or the U.S. Government or both. And this is an outlook with which we are most unhappy.

At any rate, since we are one of probably a number of U.S. firms that are being needlessly and greatly harmed by the Soviet oil and gas equipment sanction order, it would seem to us that immediate relief for such needlessly harmed companies could be justified.

The suggestion that the chamber has in this regard is that if the administration is intent on delaying construction on the Yamal pipeline, then it should revise current regulations so that they cover only gas transmission equipment technology, excluding pipeline construction equipment.

And I think probably that is the conclusion for this moment.

[Mr. Wright's prepared statement follows:]

### Prepared Statement of Michael A. Wright

Mr. Chairman, I am M. A. Wright, Chairman and Chief Executive Officer of Cameron Iron Works and past President of the Chamber of Commerce of the United States. With me this morning is Arthur T. Downey, a Washington attorney who serves as Chairman of the Chamber's Task Force on Trade with the Nonmarket Economies and Donald J. Hasfurther, Director for East-West Trade at the U.S. Chamber.

I am pleased, Mr. Chairman, that you have seen fit to call hearings on the expanded oil and gas equipment export controls and that you have given me the opportunity to testify on behalf of the Chamber on this important subject. As you are aware, the Chamber is the world's largest business association with a membership of over 255,000 small, medium and large businesses, trade and professional associations, and state and local chambers of commerce.

The Chamber has a long history of concern over the use of export controls for foreign policy purposes. Over the last year and a half, in particular, the Chamber has repeatedly cautioned the Administration with regard to both the effectiveness and the domestic economic cost of unilateral foreign policy export controls. The most significant of these communications are attached to my statement.

We have greatly appreciated the willingness of the Administration to engage us in a frank and private dialogue on the issue of trade sanctions. While we hope to continue this dialogue, we, nevertheless, believe that, in light of last month's decision to expand foreign policy controls over exports of oil and gas equipment to cover U.S. subsidiaries and licensees abroad, it is time that the debate over the use of trade sanctions be opened to full public view.

An examination of U.S. international economic policy since the foundation of our Republic reveals the propensity of American policy-makers to turn to the vehicle of trade in an effort to achieve foreign policy objectives. Our export sector, compared with other economic tools, has been and continues to be a relatively easy, indeed too easy, and seemingly inexpensive tool of U.S. policy-makers.

It is time that our policy-makers realized the long-term costs of their decisions and weighed these costs against the alleged foreign policy gains of their international economic policy decisions. It is the purpose of my testimony to introduce for discussion some of the likely costs of the President's June 18 decision to expand oil and gas equipment controls on a unilateral, retroactive and extraterritorial basis.

For the purpose of this discussion it might also be useful to look at those provisions of the Export Administration Act of 1979 dealing with foreign policy export controls. As you are aware, the Act cautions that uncertainties in export control policy may curtail the efforts of American business to the detriment of the U.S. balance of trade. As such, the Act sets out a number of criteria which the President must examine before the imposition of foreign policy controls and requires the President to make an immediate report to the Congress on his findings.

Among the criteria are the likely effectiveness of the controls in achieving foreign policy objectives, as well as the responsibility of consulting with our Allies to achieve full effectiveness of any prospective controls. The Act also requires that the Administration examine the probable domestic economic consequence of foreign policy export controls. In particular, the Administration is required to consider the likely effects of the proposed controls on the international reputation of the United States as a reliable supplier of goods and technology, and on individual U.S. companies and their employees and communities, including the effects of the controls on existing contracts.

While I wish to direct my comments to the economic costs of the June 18 controls, I would like to make several brief comments concerning the probable effectiveness of the expanded oil and gas controls and the possible implications of these controls for the multilateral, as well as domestic, economic consultative process.

First, I should note that, earlier this year, a group of U.S. industry specialists met with Administration officials to discuss the likelihood that U.S. controls could prevent or substantially delay construction of the Yamal pipeline. The group was made up of pipeline experts both with and without any monetary interest in the pipeline and consisted of a number of individuals with years of on-site experience in the Soviet Union and familiarity with Soviet gas pipeline expertise.

The consensus of those nongovernmental representatives participating in the meeting, as well as that of a substantial portion of the Administration officials in attendance, was that U.S. efforts might delay construction from 6 months to 1 year. Moreover, the group concluded that there would be no delays in delivery of natural gas to Western Europe because of present excess capacity in Soviet gas production and transmission.

On the subject of consultations with our Allies, the Administration has a long and public record of concern over the Yamal pipeline. However, the breadth of the June 18 controls has caught our Allies as much by surprise as it did the U.S. business community. As you are aware, the controls that were imposed went well beyond the pipeline to cover the entire Soviet oil and gas industry.

Moreover, with the absence of any showing of urgency, the Administration made the controls immediate rather than in a proposed form to become effective following a public comment period. As such, the U.S. decision raises serious questions with regard to the multilateral and domestic consultative mechanism and perhaps even future U.S. efforts to achieve a multilateral consensus on legitimate national security export controls.

As regards the economic costs of the June 18 controls, the Commerce Department has prepared figures of exports lost in connection with sanctions directed against the Soviet oil and gas sector. Under Secretary Olmer referred to these figures in this testimony. While these figures may be accurate for the short-term, they do not reflect the probable long-term economic consequences for the United States.

While I am testifying today on behalf of the U.S. Chamber of Commerce, I also represent one of a significant number of U.S. companies that stand to lose millions of dollars in nonpipeline-related exports, as well as millions of dollars in penalties to the Soviets. Should you wish during the question and answer period, I would be prepared to describe in greater detail the present and probable long-term costs the June 18 decision has meant for my industry.

As a result of the latest sanctions, European business will most likely become more reluctant to enter into joint venture, cross-licensing, marketing, or other business agreements which can be derailed by unilateral political decisions. Instances of this are already being encountered and, most significantly, they are by no means confined to the oil and gas sector.

Western industrialized nations will likely be encouraged to subsidize local industry to enter areas of technology heretofore left very much to U.S. producers and exporters. U.S. oil and gas equipment manufacturers will be the most obvious victims of this trend, but the damage will likely be felt in all areas of industry.

The United States will also be affected in other nonrelated trade areas. For example, U.S. efforts to strengthen and extend GATT coverage to the areas of services, investment and high technology will likely be damaged if the current mood of our trade partners persists. Unless the Administration is prepared to roll back its sanctions, it will also find it far more difficult to gain Western agreement in such areas as export credits, national procurement policies and joint energy policies.

How then should the Administration proceed and how might the Congress play a more active role in preventing in the future such dilemmas in which we now find ourselves?

First, if the Administration is intent on delaying construction on the Yamal pipeline, even at the price of future European cooperation, then it should revise current regulations so that they cover only gas transmission equipment and technology, excluding pipeline construction equipment, thus minimizing the negative aspects of these regulations for American business interests. Alternatively, the Administration should consider revising its regulations to exempt existing contracts or cases of foreign availability, as was the case with the Libyan sanctions announced in March. Such action could be justified in light of the recent release in Poland of a substantial number of political detainees.

I should add that the Chamber is no more satisfied than the Administration with the Polish action of last week. In its discussions with Polish government and foreign trade officials, the Chamber continues to stress the importance of ending martial law and returning a dialogue to Poland. The Chamber will continue to pursue this approach in the hope that substantial positive changes in Poland will lead to reciprocal movement in the United States, particularly on the question of current sanctions.

As regards the question of Congressional involvement in the export control process, next year's review of the Export Administration Act of 1979 presents an ideal opportunity for the Congress to regain intended authority in this field. In this regard, the Chairman should be commended for his insightful article in the Washington Quarterly on this very subject. At the very least, the Congress might wish to require, in the absence of an international emergency, a forum to give the public an opportunity to consult with the Administration and the Congress prior to the imposition of a foreign policy export control.

Along with this Administration's desire not to penalize any one particular sector, the Congress might also wish to place greater constraints on such sectoral export controls as has effectively been done in the case of agriculture. Certainly it is questionable whether the U.S. oil and gas equipment industry, any more than agriculture, should, without compensation, bear the brunt of foreign policy decisions in this country.

These are but a few areas in which we hope these hearings might have a positive impact. They are proposed in no sense out of an interest in confronting the Administration or the Congress, but out of a sincere desire to cooperate with both bodies with the goal of better serving the economic and political security of this country. We sincerely hope that our thoughts are accepted in this vein and that business and government will achieve their common objectives of securing the national well being.

Attachments.

[ATTACHMENT 1]

CHAMBER OF COMMERCE
OF THE UNITED STATES OF AMERICA,
*Washington, D.C., April 23, 1981.*

Hon. WILLIAM E. BROCK,
*U.S. Trade Representative,*
*Washington, D.C.*

DEAR BILL: I am writing to you in your capacity as chairman of the Trade Policy Committee. It is our hope that the Committee will work closely with the U.S. business community for the establishment of a coherent U.S. trade policy. In particular, we hope that business views will be factored into the formation of an export administration policy.

The Export Administration Act of 1979 recognizes that uncertainties in export policy may curtail the efforts of American business to the detriment of the U.S. balance of trade. The U.S. Chamber was an early and vocal supporter of the Act in the belief that the legislation created an equitable balance between legitimate security and policy concerns and the need to increase American exports. However, the proliferation of new export controls on the grounds of foreign policy and national security has contributed to further uncertainty and frustration on the part of U.S. exporters.

American policymakers have viewed export sanctions erroneously as an effective and relatively inexpensive means by which to achieve the country's political objectives. This view is an outgrowth of the days when the United States was the preeminent economic power of the world and in many instances the sole international supplier of equipment and technology. Although this no longer is the case, policymakers in this country have exhibited an increasing tendency to use trade as a means to further such goals as the suppression of international terrorism, the enhancement of human rights, or the cessation of military aggression.

Trade sanctions have not had a clear record of success whether imposed multilaterally (Southern Rhodesia) or unilaterally (South Africa). The most dramatic use in recent years of U.S. trade sanctions were those imposed in response to the Soviet invasion of Afghanistan. In light of the current review of U.S.-Soviet relations, we believe this is an appropriate time for the new Administration to examine these and other sanctions to determine whether they have had their intended effect and to measure this effect against the costs of such sanctions to the United States. In this regard, the experiences of some of our member companies may be of interest.

As you know, several U.S. firms trace their commercial ties with the Soviet Union back to the 1920s. However, with the direct support and encouragement from the U.S. Government in the 1970s, many other businesses began to develop Soviet trade ties for the first time. We know that a number of these companies are reevaluating their commercial relationships with the USSR. It is clear now that, unless a degree of predictability is returned to the U.S. commercial decision-making process and a considerable measure of trade is restored, many companies will cease doing business in the Soviet market altogether.

Perhaps the best single example during the past year of the apparent ineffectiveness of trade sanctions involves Soviet efforts to construct a steel mill for the production of electrical steel at Novolipetsk. American companies had negotiated for as long as five years to participate in this project, and of the $353 million to be invested in the project, it was expected that $100 million in orders for U.S. equipment would result. With the imposition of U.S. sanctions, the U.S. contracts were terminated and awarded shortly thereafter to the French.

Another major project involved negotiations for the construction of an aluminum smelting complex at Sayansk. In this instance, an American company was forced to pull out of the final stage of negotiations, which would have likely resulted in the purchase of another $100 million in American equipment and technology. In this case, the West Germans were the recipients of the business lost by the United States.

Another major deal which might have resulted in American sales of some $100 million involved Soviet purchases of equipment for a project in that country's energy infrastructure. In this case, American suppliers traditionally serving Soviet needs in this area were not even invited to bid on the equipment. Instead, the Soviet Union turned to the Japanese for the necessary equipment.

Loss of participation in these three projects alone has meant a loss of some 5-6,000 potential jobs in this country, based on U.S. Department of Commerce multipliers. If this loss were measured against benefits to our national security, such as an inability of the Soviets to proceed with these projects, U.S. business would be less critical of the actions of our government. As it is, the projects are going ahead and the potential U.S. jobs have been merely given up to our trade competitors.

With the embargo on phosphate sales to the Soviet Union, again U.S. sanctions have had little effect other than to harm U.S. commercial interests. Since the embargo, the Soviets have obtained alternate supplies of phosphates from Tunisia, Morocco, Belgium and South Africa. Even more disturbing and far reaching is the fact that the Soviets have begun discussions with France and Morocco concerning the possible construction of superphosphoric acid plants to satisfy long-term Soviet needs. U.S. sanctions, rather than harming the Soviets, have put the United States in the position where it stands to lose tens of millions of dollars worth of sales to the Soviet Union and have encouraged the creation of a permanent competition for U.S. suppliers.

Because of U.S. price supports and government purchase programs, it is much more difficult to assess the direct economic impact on U.S. agriculture of the U.S. embargo to the Soviets of grain and other agricultural commodities. Perhaps a more important question is the long-term effects on future trading patterns resulting from a Soviet perception of commercial unreliability of U.S. agricultural suppliers. The economic impact on the Soviet Union of the grain embargo is also open to question. According to original Department of Agriculture projections, the cancellation of 17 million metric tons of U.S. grain shipments would result in a total Soviet shortfall of 8-13 million metric tons. Some recent estimates, however, place Soviet grain imports last year as high as 36 million metric tons, which, if true, would seriously call into question the effectiveness of the U.S. embargo.

There are numerous other examples where opportunities for U.S. sales were sacrificed to the advantage of our trade competitors without any perceivable impact on the Soviet economy. This is particularly true in the electronics and energy fields. In addition, such losses have a multiplier effect on related fields, such as transportation and insurance.

In light of these results, the U.S. Chamber offers the following recommendations for consideration by the Trade Policy Committee:

First, the President's ability to employ export controls to further our national security should be continued. Such controls, if undertaken within the letter and spirit of U.S. law, should be supported. Implicitly, however, this requires real determination of the actual contribution of U.S. exports to the military potential of an adversary country. Furthermore, the imposition of such controls, except under the most extreme circumstances, should be multilateral in nature, with the full support of our allies.

Second, there is ample evidence that the unilateral imposition of trade sanctions has been ineffective in changing foreign behavior. Recent sanctions invoked for foreign policy purposes have been imposed without due regard to the provisions of the Export Administration Act requiring the President to determine the likelihood that export controls will attain foreign policy objectives and determine the probable domestic economic consequences of such sanctions. The existence of alternate suppliers of goods, technologies and services has undermined the effectiveness of unilaterally imposed export controls, and as a result, these controls have had merely a symbolic rather than substantive effect. Consequently, we believe that unilateral trade sanctions for foreign policy purposes should be avoided as they have proven to be costly in terms of lost exports, foregone markets, and allegations of commercial unreliability.

If the President determines that the employment of economic tools to achieve foreign policy goals is essential, consideration should be given to broadening the sanctions to include all facets of economic interaction, including investments, imports, and services such as transportation, insurance and banking. There is no reason why the U.S. export sector alone should be forced to shoulder the burden of U.S. policy decisions. Furthermore, we believe that the President, when faced with the possibility of restraining all facets of trade and economic cooperation, may give closer consideration to the economic consequences of foreign policy sanctions and, therefore, invoke such controls in only the most serious situations.

We hope these recomendations will be of value in the course of your reevaluation of U.S. trade policy. We believe there is an urgent need to return a degree of consistency and predictability to the U.S. export administration process and view this as a key step in any program to improve the competitiveness of U.S. exports abroad.

Sincerely,

Richard L. Lesher.

[ATTACHMENT 2]

Chamber of Commerce
of the United States of America,
*Washington, D.C., February 5, 1982.*

The President,
*The White House,*
*Washington, D.C.*

Dear Mr. President: We have been led to believe that the Administration is seriously considering sanctions against West European firms to force compliance with our foreign policy sanctions related to the Yamal pipeline. I want to share with you our concerns that reported U.S. actions under consideration would be unprecedented and may not be in the best interests of this country.

Western debate over the benefits and liabilities of the pipeline has set the stage for a potentially dangerous conflict within the Atlantic Alliance on the question of Soviet energy development. Rather than viewing the pipeline as a source of dependence upon the Soviets, our Western European allies view the project as a means of cutting their present dependence upon Middle Eastern energy sources—a policy activley encouraged by our country until recently.

Moreover, the possibility of extraterritorial controls over the activities of West European firms utilizing U.S. technology raises serious implications for U.S. foreign economic policy and our trade relationships around the world.

If our major concern with the Yamal pipeline is the potential for European energy dependence upon the Soviet Union, then it is imperative that we give priority to helping the West Europeans develop timely alternative energy sources. This need not suggest that we should undertake a simultaneous effort to impede construction of the Yamal pipeline. A good case can be made that the pipeline increases total world energy supplies to the overall benefit of the United States. Furthermore, if alternative energy sources were made available to Western Europe, it could be argued that the pipeline gives these countries, as major importers, a degree of leverage over the Soviets rather than vice versa.

On the other hand, if the Administration's objective is to minimize the contribution the pipeline might make to the Soviet economy through hard currency earnings, then this raises a new and unprecedented issue which goes to the core of U.S. policy on East-West trade. Such a profound change in policy could be likened to a strategy of economic warfare. Undoubtedly, it would require a recalculation of international business strategies for many U.S. firms involved in trade with Eastern and Western Europe. If this is the approach being considered, I urge the Administration to consult with the business community before such a policy is announced.

Finally, we would hope that the Administration has carefully weighed the consequences of any efforts to maintain strict extraterritorial control over American goods and technology abroad. In building overseas markets so vital to our economic security, U.S. export performance relies heavily on both quality and dependability. Extraterritorial controls will only aggravate further our already poor international reputation for commercial reliability.

Sincerely,

RICHARD L. LESHER.

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[ATTACHMENT 3]

CHAMBER OF COMMERCE
OF THE UNITED STATES OF AMERICA,
*Washington, D.C., March 1, 1982.*

Hon. WILLIAM E. BROCK,
*U.S. Trade Representative,*
*Washington, D.C.*

DEAR BILL: I wrote you in April of last year to express the Chamber's views regarding the use of trade sanctions. I would again like to reiterate the U.S. business community's support for legitimate national security and foreign policy export controls and applaud the Administration for its efforts to achieve a multilateral consensus within the Western Alliance on the use of these controls. However, we continue to be concerned over unilateral export controls imposed for foreign policy purposes when those controls succeed only in penalizing the U.S. exporter. If it could be demonstrated that such controls achieve the stated objective either of harming our adversaries or in forcing a change in their behavior, I believe U.S. business would be prepared to support the Administration and forgo export sales to these countries. However, if these foreign policy controls result merely in a loss of sales to our trade competitors without any significant effect on our adversaries, we must question the appropriateness of such controls.

In this regard, I would again like to commend the Administration for its decision last year to lift the Soviet grain embargo. As Secretary of Agriculture Block recently stated, U.S. agricultural embargoes have had the short-term effect of depressing farm prices and the longer-term impact of closing off markets and stimulating foreign competition. Agricultural embargoes also have proven to be costly to American taxpayers and detrimental to this country's economic growth and efficiently. As Secretary Block documented before the Senate Agricultural Committee, the existence of alternate suppliers has caused U.S. agricultural embargoes to be both ineffective in harming our adversaries or in forcing a change in their behavior.

We are in full agreement with the Secretary's views, but believe that the applicability of his findings goes far beyond the agricultural field. The trade-diverting effects of sanctions have been well documented by a number of companies which have seen export sales of their commodities, equipment or technology embargoed in recent years. Several other American companies, the export sales of which have reportedly been considered for sanction, have information indicating that such potential sanctions would likely result only in lost U.S. exports rather than any significant foreign policy gains. Should you wish information in this regard, we would be most pleased to put you in contact with these companies.

I bring this to your attention in light of the Administration's current review of its sanction policy. As was the case with the agricultural embargo, we urge the Administration to weigh carefully the short and long-term economic consequences of any present sanctions. We also urge the Administration to examine carefully the probable domestic economic impact, as well as likely effectiveness of any additional sanctions, prior to any future decisions in this area.

I would like to conclude by again emphasizing that U.S. business is prepared to support the actions of this Administration and to forgo export sales, if by doing so we contribute to the national interest of the United States. However, if such actions result merely in the loss of sales to our trade competitors without significantly impacting upon our adversaries, then we must question whether we are sacrificing our export goals for no apparent national gains.

Sincerely,

RICHARD L. LESHER.

[ATTACHMENT 4]

CHAMBER OF COMMERCE
OF THE UNITED STATES OF AMERICA,
*Washington, D.C., June 18, 1982.*

Hon. WILLIAM P. CLARK,
*Assistant to the President for National Security Affairs,*
*The White House,*
*Washington, D.C.*

DEAR BILL: It has been brought to my attention that the President very soon will make a decision on the question of U.S. involvement in the Yamal pipeline. I have also been led to believe that the decision may reflect the view of those in the Administration who advocate harming the Soviet economy irrespective of the consequences for our own economy.

As you know, the Chamber has deep and long-standing reservations over the unilateral application of trade sanctions. Once again, it appears as if our government may take actions which may have little more than symbolic value, but which may have adverse long-term implications for U.S. industry. If this is the case, I fear not only that our trade sector will be harmed, but that any ability we ever had to moderate Soviet behavior through trade will be ended.

We continue to support the President's efforts to tighten controls over the export of militarily critical goods and technology to the Soviet Union and to curb the subsidization of export credits to the Soviets. On the other hand, we find it difficult to support unilateral policies that succeed in penalizing U.S. industry to the benefit of our trade competitors and that may make multilateral consensus in the export control and credit areas even more difficult.

For your information, I am also sending identical letters to White House Chief of Staff James A. Baker III, Counselor to the President Edwin Meese III, and U.S. Trade Representative William E. Brock.

Sincerely,

RICHARD L. LESHER.

[ATTACHMENT 5]

CHAMBER OF COMMERCE
OF THE UNITED STATES OF AMERICA,
*Washington, D.C., July 14, 1982.*

The PRESIDENT,
*The White House,*
*Washington, D.C.*

DEAR MR. PRESIDENT: The Chamber of Commerce of the United States has given serious attention to your decision last month to impose export controls on oil and gas equipment and technology to the Soviet Union for foreign policy reasons. Our examinations have led us to several major reactions that we wish to share with you.

We share your disappointment that there has been little evidence of positive movement to ameliorate the present situation in Poland. The Chamber supports the efforts of the Adminstration to bring about a rescission of martial law and a renewal of dialogue in that country. Moreover, we support your efforts to tighten controls over the export of militarily critical goods and technology to the Soviet Union and to curb the subsidization of export credits to the Soviets.

However, the Chamber of Commerce views with concern the decision to extend unilaterally U.S. export controls over oil and gas equipment and technology, including but not limited to that bound for construction of the Yamal pipeline, on an extraterritorial and retroactive basis. The unprecedented blanket prohibition and U.S. subsidiaries and affiliates and control of previously licensed U.S. technology pose serious questions concerning the present direction of U.S. international economic policy. This action has ramifications that go well beyond America's trade relations with the Soviet Union.

Over the last year and one-half, the Chamber has repeatedly cautioned the Admininstration with regard to both the effectiveness and the domestic economic cost of unilateral foreign policy export controls. In building overseas markets so vital to our economic security, U.S. export performance relies heavily on both quality and dependability. In this regard, the Chamber is concerned that the new controls will only aggravate further our international reputation for commercial reliability.

We know that the government regulations that have been written after your recent decision to extend controls allow a comment period until August 21, 1982. In this context, if you are intent on delaying construction on the Yamal pipeline, then we urge you to revise current regulations so that they cover only gas transmission equipment and technology, excluding pipeline construction equipment, thus minimizing the negative aspects of the decision for American business interests. The U.S. Chamber would be happy to work with the Administration during this period with this goal in mind.

Sincerely,

RICHARD L. LESHER.

Senator MATHIAS. That is a very interesting story and I think it is a helpful addition to the record because it is real life. It is not some speech, and it is not some speculation; it is what has happened.

Senator Percy was called out of the room but he asked me to propound this question to each of you. Is there the probability that the present sanction policy could have a long-term adverse reaction and harm the U.S. reputation as a reliable supplier with countries other than the Soviet Union?

I think Mr. Wright has already answered that question, but let me start with Mr. Donaghue for Senator Percy's benefit.

Mr. DONAGHUE. I personally feel that it will have a long-term effect upon the United States. I was in Europe for 3 weeks while all this was going on. In discussions with other business people outside of the oil and gas line business, the feeling that I discerned was one of betrayal on the part of the United States in this particular decision. They felt that there was an understanding after the Versailles summit that the Europeans would be allowed to proceed with the pipeline business.

The fact that we in the United States, every time we want to signal the Soviets, change our policy toward trade makes us not only an unreliable supplier for the Soviet marketplace, but in the minds of many of the Europeans.

Senator MATHIAS. Would you agree, Mr. Hewett?

Mr. HEWETT. Mr. Chairman, I certainly do agree. Any company in the world considering the purchase of American technology as opposed to, say, Japanese technology, now has to think about the possibility that the U.S. Government at some point in the future for foreign policy reasons may undertake sanctions against that company to stop it from exporting that product to some other country.

And that means that if there is a choice and if the choice is not terribly costly for a technology other than United States, they are likely to take that choice.

Senator MATHIAS. Mr. Katz?

Mr. KATZ. Yes, Mr. Chairman, that indeed was the thrust of my statement, that there are long-term costs of such a policy. It doesn't mean that the rest of the world is going to stop doing business with us, but it will certainly give them pause.

I am aware of instances in the past where similar policies have led to the severance of relations with American firms where agents of American firms have said simply: We would prefer not to do business with you anymore. I do not think there is any question that this will have a longer term damage on the United States.

Senator Mathias. And I think we know Mr. Wright's views on that subject.

Mr. Hewett, in your statement you talk about the only way significant delays would develop and so forth. Could that be interpreted by the administration as an incentive to deal very toughly with the Europeans to restrain them from going into the additional production that you mentioned? And to keep from negotiating new contracts?

Mr. Hewett. Yes.

Senator Mathias. So in other worlds, if we are really serious about this, we are going to have to get very tough with the Europeans.

Mr. Hewett. We are going to have to get very tough, particularly with France, because of the critical role of Alsthom Atlantique, which is a nationalized firm. And certainly, if we can stop Alsthom from accepting the contract beyond the 40 rotors, it would force the Soviets into less appealing options, but even then it would be nowhere near as costly as the administration seems to think it would be.

Senator Mathias. Of course, if we have to get tougher with the Europeans, and we have the steel problems which are real and the agricultural trade problems which are real and other difficulties, I think it might make everyone pause.

Mr. Katz, you have had distinguished service in Government, and you know the real life situation when the President of the United States has come down on an issue and doesn't leave you much maneuvering room.

Mr. Katz. No, sir, it doesn't. I said to Mr. Olmer on the way out, I wouldn't have his job for anything at this point. It is tough. In response to your previous remark, I would be careful not to try to link this matter to other problems. I think it is true and it is obvious that——

Senator Mathias. I don't intend to link them. I just merely say that we are living in that atmosphere.

Mr. Katz. Certainly, the atmosphere is not a very helpful one for the resolution of any of these issues. Yet, I think each of them really stand on their own. I think there are very strong reasons for trying to deal with the steel problem, with the agricultural subsidies and this one, except in this area we have pretty well turned off the microphones and said we are not prepared to discuss it.

I think arguing about the legalities of this really doesn't help very much because I don't think it is a legal problem. I have no doubt that we can cut off trade to offending firms, but that further exacerbates the problem we are talking about. What is the impact? What is the other side of the coin? Do we hurt ourselves as much or more than we hurt the Russians?

So I think it is a very difficult problem. I like Senator Percy's analogy with the Edsel. I think we have a bad product here. We ought to redesign it or decide that it won't sell.

Senator Mathias. What about the administration's argument that we are so strong, that our industry is so strong, that our technology is so unique that the world is going to beat a path to our door, in spite of this kind of activity? Do you agree with that, Mr. Donaghue?

Mr. **Donaghue**. No, I don't. It might have been true at one time in the past, but even in computers we find that the world is fast catching up with the United States, especially the Japanese. I think that applies to a great number of areas of high technology today.

And for those that cling to that view, that myth, and based on them affect our trade policies are making a big mistake.

Mr. **Wright**. I think you only have to look at some other historical facts to raise a real question. For instance, we invented the automobile. We had that technology. Look where we are. We were foremost in steel; now look where we are. We were foremost in computers, and now look where we are. And all these kinds of things. You can't rest on your laurels.

It is an ongoing thing, and as a part of your program, you have to keep this technology rolling in order to stay ahead. If you once get behind with competitors like we are talking about—and they are smart, maybe not as ethical as some other people as to how they get technology or where they get the technology—but they have a central driving force, and we just can't sit back and say we have it, and it is going to stay that way.

Senator **Mathias**. I think that is an important perspective, Mr. Wright, and it recalls Senator Pell's question earlier today. Is there a case in history in which an embargo has ever really been effective in changing the policies of the embargoed country? And that, of course, is one of the philosophical questions I posed at the opening of this session.

Does an embargo hurt the embargoer or the embargoee in equal amounts? Mr. Katz, have you any reflection on that?

Mr. **Katz**. Yes, sir. I think the answer to that is quite simply no, and I think perhaps the best, probably the strongest application of sanctions, of international sanctions, that I am aware of applied to Rhodesia. Sanctions which were imposed in response to a United Nations resolution, which was at least formally adopted by all members of the United Nations. There was some question about performance in certain cases. Clearly, there were leakages. There were—I have heard people describe the streets of Salisbury with brandnew Chevrolets rolling down the streets or Toyotas. But clearly, the weight of the world was against the Ian Smith regime, and in the end it was brought down not by sanctions but by internal warfare.

So I think there are innumerable cases where we have employed such sanctions. We have applied economic sanctions more frequently than other countries. And the experience has pointed up the limited effectiveness of sanctions.

Senator **Mathias**. Can you think of any circumstances under which an embargo might work? Mr. Hewett?

Mr. **Hewett**. Well, if we could get Argentina, Canada, and Australia to agree with us on grain, we would have a rather substantial impact on the Soviet economy. I don't think in areas of manufactured goods where you are talking about a middle-level technology that it is conceivable.

Senator **Mathias**. In other words, you are really talking about a single source situation.

Mr. **Hewett**. Yes, and we are not in that situation now.

**Senator Mathias.** And as Mr. Wright has illustrated by his own case, this is not a single source situation.

**Mr. Hewett.** I might say, if I could comment on several things that have been said, one of the interesting effects of the embargo has been to stimulate the Soviets to speed up development of their own new, high speed turbines. I know what their schedules were before.

**Senator Mathias.** That is my dragon's teeth story.

**Mr. Hewett.** Yes, it is your dragon's teeth story, and there is considerable evidence that the dragon's teeth are now bearing fruit in the Soviet Union.

**Senator Mathias.** So we have stimulated our own competition. How can a serious magazine like Business Week come to the conclusion that the embargo could seriously delay or even block construction of the pipeline? Can it block construction?

**Mr. Hewett.** No. They have been talking to the wrong people. That is how they came to that conclusion. They cannot block construction of that pipeline. In fact, I think even if it is necessary to use 20,000 Russian peasants at the other end blowing the gas down, you are going to see that pipeline working.

In the first place, I point out that the Soviets have no problem laying pipe. They have as much experience as anyone in the world with 56-inch pipe. But a third of the pipe has already been shipped to the Soviet Union by the Germans and the Japanese, and about 130 kilometers are now down.

The only question is the compressor stations, and they are already beginning construction of those. There will be a pipe. The question is how fast gas will come out of the pipe. As the administration finally realizes, the Soviets already have excess capacity to meet a third of the deliveries they are committed for right now in 1984–85.

So the question is really what is going to happen in 1986 through the end of the century. And there, I think it is quite clear that the Soviets, with really considerable ability to make do under horrible circumstances, will get that pipe going and will meet the delivery schedule.

**Senator Mathias.** I have just one other question to ask each of you. I am enormously interested in the ability of the United States to continue to compete effectively in the economy of tomorrow. If we are to do the things we need to do in the world, we have to be able to buy in world markets, and above all, we have to be able to sell in world markets. We have to, in an economy that is increasingly international and interdependent, we have to continue to play a role.

If this situation is not resolved somehow, do you think there is any danger that American subsidiaries located in foreign countries will end up being treated differently in some special way from the subsidiaries of other countries, or from domestic companies in those host countries? What kind of danger do we have with that sort of discrimination growing out of this kind of activity? Mr. Katz?

**Mr. Katz.** Yes, Mr. Chairman. I have made reference in my statement to problems that we have had in the past with Canada and France. And the fact that nationalists in those countries, nationalists in Canada, economic nationalists, continue to refer to cases that go back to the 1950's where we sought to use American firms as instruments of our policy.

American firms are just simply suspect. They are regarded as instruments of American policy because they have been used in that way. They are being used in that way again.

The Canadian Foreign Investment Review Agency [FIRA] regulations, which is the subject of some debate now, grew precisely out of that kind of problem. There have been a number of problems with Canada as well as with France.

If I may refer to the question of our competitive position in the world, here again, our problem is one of lack of constancy. It took us a long time to come to the realization that we had lost our competitive edge in the world. It took us a long time to get attention in the Congress and in the administration that we had to address these problems.

And it wasn't just the conditions of trade, whether they are fair trade or unfair trade. That is a part of it. But part of it is just that we have slipped in some areas of technology, and you don't develop new technology, you don't improve your technology, you don't hone your competitive edge when your industries are working at 40 percent of capacity.

Our current economic problems obviously do not rise out of the embargo situation, but they are further exacerbated by the embargo. It goes beyond the impact of Mr. Wright's company or any other company. It is the overall impact on American firms that want to go out and work in the international arena. It also affects the willingness of foreign firms where it makes a difference to decide to deal with an American company rather than some foreign supplier.

Senator **Mathias**. Is there any other comment on that?

[No response.]

Senator **Mathias**. I have here a memorandum from the Ambassador of the Federal Republic of Germany, and I will make that a part of the record. But among the assessments of the U.S. measures of December 1981, it is stated that, "The Federal Government has repeatedly asked the U.S. administration to review its measures of December 1981 and take account of the fact that the contracts concluded by the German companies with General Electric and with the Soviet Union acquired binding effect even before martial law was imposed in Poland and the U.S. measures were taken."

And they take issue with that. Is this, in your judgment, going to further exacerbate the economic problems of the Europeans?

Mr. **Wright**. I really don't know how to answer the question. But we have a manufacturing plant in Germany, Celle, which is just outside of Hamburg, 23 miles. This is an old oil city in the early stages of development in Europe. And since this problem has developed, people have informed us that there have been three German companies formed in this one city for the purpose of building BOP's and maintenance work, and this is our field.

These people who have some capability. They are now subcontractors, for instance. We have subcontractors working on parts that we have the technical licenses on and so forth, and patents.

But if the country of Germany decides that these people should be delivering this equipment, I would think we would be in a real tough situation.

Senator **Mathias**. Gentlemen, we are very grateful to you for coming here. I know it is not pleasant nor easy to come down and to criticize the actions of the administration. I don't take it as negative criticism but as positive criticism in an effort to try to assess where we are, and to try to find the best road for the country to follow from this point on.

That is the spirit in which the committee is meeting, and I know it is the spirit in which you are here today. But it is an extremely difficult problem, and I can't say that you have raised my spirits or my level of optimism any by your testimony. But I am nonetheless grateful to you for being here. Thank you very much.

We will include the letter from the Ambassador of the Federal Republic of Germany, and a memorandum that he has enclosed, and a letter from the German-American Chamber of Commerce, addressed to this subcommittee.

[The information referred to follows:]

The Ambassador
of the Federal Republic of Germany,
*Washington, D.C., July 29, 1982.*

Hon. Charles McC. Mathias,
*Chairman of the Subcommittee on International Economic Policy of the Senate Foreign Relations Committee, Washington, D.C.*

Dear Senator Mathias: I take the liberty to transmit to you a memorandum of the Government of the Federal Republic of Germany stating its position on the West European-Soviet gas-pipeline project.

Sincerely yours,

Peter Hermes.

## Memorandum

Position of the Government of the Federal Republic of Germany on the natural gas project between Western European companies and the Soviet Union.

### (I) ASSESSMENT OF THE PROJECT

The Federal Government holds a positive view of the participation by German firms in the natural gas project between Western European companies and the Soviet Union since it results in a diversification of German energy supplies and contributes towards stabilizing economic relations with Eastern Europe.

Critics of the project may take note of the fact that the Federal Government, before approving the deal, carefully examined the question of dependence and the possibility of obtaining natural gas from other sources. An industrialized country like the Federal Republic of Germany which has to import virtually 60 percent of its energy supplies can best counter the external risks connected with energy imports by diversifying its sources as far as possible. Like that of our partners in the European Community and the International Energy Agency our main concern is our high dependence on oil from the critical areas of the Middle East and the Persian Gulf region (in 1981 OPEC supplies accounted for 22.5 percent of our primary energy consumption). Obtaining natural gas from the U.S.S.R. is a method of diversifying our energy supplies. It also helps greatly to make the natural gas coming from reliable sources in Western Europe last longer. This is backed up with economic and administrative safeguards, such as the stand-by capacity from the Netherlands and in the Federal Republic of Germany, contracts that can be suspended, underground storage tanks, and the national and international pipeline systems. The gas consumption forecasts for Western Europe which are now slightly lower must also be seen as favorable in this context. Soviet natural gas supplies currently account for 3 percent of our primary energy consumption and will rise to about 5–6 percent by 1990 (cf. oil supplies from OPEC as a whole: 22.5 percent, Saudi Arabia: 10.1 percent, Libya: 4.5 percent). It is often incorrectly asserted that natural gas could be obtained instead from Norway, the Netherlands and Great Britain. The actual situation in these countries shows that this viewpoint is unrealistic. Apart from the technical and economic problems involved in raising Norwegian natural gas production to such an extent, we must respect Norway's policy on what it considers feasible with regard to hydrocarbon production. From the mid 1990's onward, Norway will increasingly take the place of the Netherlands as a reliable supplier of gas. It cannot, however, start the increased production before the mid 1990's, and therefore not replace the amounts to be supplied by the U.S.S.R., which, incidentally, compensates in part the shortfall in supplies from Iran, which were initially contracted in the late 1970's based on a trilateral deal with Iran and the U.S.S.R.

Furthermore, the Federal Goverment does not share the concerns expressed by the U.S. Administration over the Soviet Union's anticipated foreign exchange earnings. Only when the maximum level is reached in the late 1980's will the U.S.S.R. be able to achieve annual earnings of $3–4.5 billion on the basis of current prices. These earnings must initially be used to meet the high capital expenditure incurred. In addition, they will be obtained at a time when, according to forecasts by the U.S. Administration and other Western governments, Soviet earnings from oil exports to the West will have diminished or ceased completely. This loss of earnings will be even greater than the expected growth in earnings from the gas exports. Moreover, it should be borne in mind that with its foreign exchange earnings the U.S.S.R. can purchase in the countries of the Western alliance only products not subject to COCOM controls. Western export industries will benefit from this. Despite all understandable scepticism, the overall effect of the foreign exchange earnings and the project as a whole for the economic and military strength of the U.S.S.R. should not be overrated. Each year the U.S.S.R. builds several times this amount of energy pipelines in its own country. Its annual arms expenditure is over thirty times higher than the gross foreign exchange earnings from the natural gas project, from which amortization has still to be deducted.

It is also incorrect to claim that the U.S.S.R. will derive unilateral advantages from the project. There are no specific German subsidies, such as cheap export credits or an artificial increase in the price of the gas. Although the interest rate calculated by the banks is below market rates in order to compete with other offers, the U.S.S.R. has to pay correspondingly higher prices for the equipment since the banks have to meet the costs of refinancing the credit at market rates. The price of the Soviet natural gas is below that of North Sea gas and considerably lower than that demanded by Algeria. Parity with crude oil was not granted.

### (2) ASSESSMENT OF THE U.S. MEASURES OF DECEMBER 1981

The Federal Government has repeatedly asked the U.S. Administration to review its measures of December 1981 and take account of the fact that the contracts concluded by German companies with General Electric and with the Soviet Union acquired binding effect even before martial law was imposed in Poland the the U.S. measures were taken. The German companies started production since they had faith in the validity of the contracts and the information obtained beforehand from the U.S. Administration. Moreover, some of the turbine rotors made by General Electric have already been supplied to Europe, paid for by the German companies and are now in their possession (there is no way of using them outside the project with the U.S.S.R without incurring losses).

When judging the fact that European companies concluded their contracts in 1981, it should aslo be borne in mind that the U.S. Administration lifted its grain embargo against the U.S.S.R. in 1981. By greatly increasing its grain exports the United States has become in 1982 the biggest Western supplier of the U.S.S.R. overtaking Japan and the Federal Republic of Germany.

### (3) ASSESSMENT OF THE U.S. MEASURES OF JUNE 1982

The U.S. measures of June 1982 have posed further serious problems that can only be resolved through their re-adjustment. Attention is drawn to the following points in particular:

(a) The U.S. measures as they apply in the present case are unacceptable under international law because of their extraterritorial aspects. This is also the common view of the other Western European governments. There is now a considerable risk of the conflict escalating.

(b) These measures also interfere with previously concluded licensing contracts and unduly contain an element of retroactivity.

(c) German companies are threatened with even greater damage which could result in factories being closed. As it is, unemployment is already above average in the region where the turbines are being manufactured for the project.

(d) Due to the extraterritoriality of the U.S. measures, German and other Western European companies will be forced to develop their own technologies in the future so that they can remain a reliable supplier. This development will necessarily have an adverse effect on transatlantic co-operation between companies, which the Federal Government has always advocated and from which U.S. companies have derived annual earnings of over $1 billion in form of licence fees from the Federal Republic of Germany alone. The Confederation of German Industry, the American Chamber of Commerce in Germany and the German-American Chamber of Commerce in the United States have drawn particular attention to these adverse effects.

(e) If the U.S. measures are maintained, the U.S.S.R. will seek to make itself independent of Western supplies in this sector, too, as it already did after the pipe embargo of 1962 by building large pipe production facilities of its own. The U.S.S.R. will thus be in a position to demonstrate that the U.S. embargo is ineffective. It has already built prototypes of the larger type of turbine whose capacity even exceeds by 10 to 15 percent that of the turbines originally envisaged. Moreover, it is constructing a large number of smaller turbines that can be cominbed to form turbine blocks. Finally, it will be all the easier to demonstrate the ineffectiveness of the embargo since there is still unused capacity in the existing pipeline system.

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German American
Chamber of Commerce, Inc.,
*Washington, D.C., July 28, 1982.*

Senator Charles McC. Mathias,
*Chairman, Subcommittee on International Economic Policy, Washington, D.C.*

Dear Senator: Enclosed please find the position of the German American Chamber of Commerce on the subject matter you will be dealing with in the Hearing of your Committee scheduled for Friday, July 30th.

We would appreciate your incorporating these comments into the record and bringing them to the attention of the members of your Committee.

Very truly yours,

Dr. Lothar Griessbach, *Director.*

Enclosure.

### COMMENTS ON THE SUBJECT OF THE CONSTRUCTION OF A GAS PIPELINE IN THE SOVIET UNION

The German American Chamber of Commerce has followed the development of U.S. policy on the gas pipeline deal between European companies and the Soviet Union with continued attention and, at times, concern. We have previously disseminated factual information in defense of the European position. Our expectations that these arguments would prevail have been disappointed by the action taken by President Reagan. The Chamber, whose members not only account for the overwhelming majority of all trade and investment between the Federal Republic of Germany and the United States but which also represents the views held by the Federation of German Industry (BDI) and the Federation of Trade and Industry (DIHT) has recently written to President Reagan; a copy of the letter in question is attached.

We would like to encourage the Committee and the Parties involved to look beyond the present situation and to try to improve the Western political and economic posture for the future.

It is now clear that U.S. policy on the gas pipeline deal has cast doubt among European companies on the validity of cooperative arrangements with U.S. corporations. We realize that the U.S. Government has voiced concern over the deal soon after its inception. The dialogue between U.S. business and the European companies involved had consequently been extensive, particularly because of the planned cooperation but also because of original U.S. competition for the project. Essentially, there was agreement all along that the deal would be economically beneficial and justifiable on political grounds. The opposition voiced in the United States has not convinced the European side. On the other hand, the impression was that the counter arguments raised by German companies and the Government of the Federal Republic of Germany have not been appreciated by the U.S. side. It was particularly disturbing to see that the emphasis of U.S. arguments on various aspects of the deal has shifted in the process. First, emphasis was placed on the aspect of energy security. The European position here is that the percentage of planned supplies is marginal and does not contain a risk of dependence.

Clearly, preserving resources in the Western hemisphere, namely Norwegian, Dutch and Algerian gas, in exchange for an increased supply from the Soviet Union would not impair but would increase independence. It should be noted in this context that Western Europe has been buying gas from the Soviet Union for many years and that the Soviets have demonstrated reliability as a supplier even in times of political tension. Moreover, gas supplied by the Soviet Union will in part be stored underground and will provide a buffer for emergency situations.

It is the impression in Europe that when the argument of energy security did not hold, emphasis was shifted, among others, to the issue of foreign currency aspects. Few data are available on the true impact and the actual magnitude of foreign currency in the Soviet and more generally in the Eastern Bloc economies. Until recent U.S. studies on the subject are published, we cannot contribute much to that discussion. It is a fact that loans by German banking institutions and suppliers of equipment to the Soviet Union have declined gradually over the past several years, and so has West German trade with the Soviet Union. According to the most recent monthly report of the German Federal Reserve Bank of July 1982, Germany's share in the total debt to Western countries estimated at $70 billion amounts to only ⅛ or approx. $8.5 billion, which is low compared to her trading position.

With respect to the rate of interest charged for the delivery of the equipment, it should be noted that it is not government subsidized but is the responsibility of the companies involved; it is compensated for by the prices charged for the equipment and the gas.

Very recently, the U.S. Government has again shifted its focus publicly to the motive of imposing sanctions against Soviet policy vis-a-vis Poland. Since the foreign policy of the Federal Republic of Germany or the United states is not our domaine, we would like to limit ourselves to reflect on the political implications as they are seen by most Europeans on the basis of their experience with boycotts. While there is general agreement on the political goal of improving the situation in Poland, it is widely believed that the impact of the measures imposed is over-estimated in the United States; boycotts of this kind are not effective, in particular if they are not multilateral and unequivocal, leaving such major items as the U.S. grain sales untouched.

Public speculation by some U.S. Government officials on how to eventually treat foreign nationals or companies who do not comply with U.S. law, has been particularly ill received. It is considered a sad occurrence between friendly nations that measures of such a nature on such questionable grounds of international law are being contemplated. Since the U.S. Government is not dealing with U.S. nationals or companies it has no jurisdiction. Given its apparent isolation, it cannot claim to follow principles of international law in enforcing U.S. export controls in this case—in particular since the conduct of foreign companies is in accordance with their national law. Compliance with U.S. demands may, in turn, constitute a violation of foreign or, more specifically, German domestic law. The findings of the International Court of Justice, government practice, and scholarly writings indicate that there is no clear rule of customary international law against extending national jurisdiction to foreign nationals or companies; it seems clear, however, that the limits are where interference with declared interests of other States is imminent, regardless of whether their policy is considered to reflect poor judgment or not.

Given the determination of European companies to fulfill their contractual obligations toward one another and the Soviet Union, what has to be considered on this side is whether the long-term effects of this policy are in the best interests of the U.S. companies and the United States as a whole. Already it is very likely that companies outside the United States will in the future prefer other than U.S. companies where the merchandise or licenses to be obtained remain, for an indefinite future, subject to U.S. policy controls. Since the U.S. economy on the whole reaches out to foreign markets, and must do so in a world of growing economic interdependence, this consideration is of vital importance.

One technicality considered to be very important is the timing or the retroactive impact of this and similar actions. Purchasers must at one point in time be sure that the merchandise or license they have acquired is really theirs to use. Conditional sales contracts are impracticable. It is important to stress that while U.S. concerns were voiced prior to the signing of the various segments of the deal, no prior U.S. action was taken nor announced in case the contract should be signed, perhaps mainly because the Polish crisis has not yet arisen.

It cannot be the purpose of our comments to suggest, at this time, specific guidelines suitable to restore the viability of cooperation with U.S. companies; obviously, the speedy elimination of the sanctions would help. However, it is our feeling that solutions should be sought following the concept of a consensus mechanism, thus achieving predictability in timing and scope; in this instance, a project considered by the Europeans to be reasonable and very important for their future, is impaired because of the lack of both, consensus and predictability.

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GERMAN AMERICAN
CHAMBER OF COMMERCE, INC.,
*New York, N.Y., July 19, 1982.*

The PRESIDENT,
*The White House,*
*Washington, D.C.*

MR. PRESIDENT: Our organization represents 2,000 American and German companies who have a long-standing and firm commitment to international trade and account for the overwhelming majority of bilateral business between the United States and the Federal Republic of Germany. Not so incidentally, commercial exchanges between our two countries have risen steadily over the years and have in the last four years reflected a surplus in favor of the United States.

We feel that we should advise you that our members, both American and German, view your recent embargo on U.S. technology licenses outside this country with dismay. What concerns us is not the politics but the principle. This action has set a grave precedent which (1) calls into question the reliability of contracts signed with American firms, (2) applies a dimension of extra-territorial control by the U.S. government that is incompatible with modern economics and free trade, and (3) introduces ex post facto review onto the business agenda of our American member firms that will impose severe damage on their present and future business opportunities.

We therefore urge you to reassess your position in this matter. As we have pointed out, the practical implications of this policy could have potentially disastrous ramifications for American and all Western businesses, affecting both the quality and continuity of relationships which are the very life blood of our commercial societies. Like you, we believe in and support the practice of free trade and the idea of fairness. With these principles in mind, we trust that a review of your current policy can produce a compromise that will restore the integrity of our trade structure.

Very truly yours,

DR. EUGENE A. SEKULOW,
*Chairman of the Board.*

WERNER WALBROL,
*Executive Director.*

Senator MATHIAS. The committee will stand adjourned, subject to the call of the Chair.

[Whereupon, at 1 p.m., the subcommittee adjourned, subject to call of the Chair.]

# ECONOMIC RELATIONS WITH THE SOVIET UNION

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## THURSDAY, AUGUST 12, 1982

United States Senate,
Committee on Foreign Relations,
*Washington, D.C.*

The committee met, pursuant to notice, at 10 a.m., in room 4221, Dirksen Senate Office Building, Hon. Charles H. Percy (chairman of the committee) presiding.

Present: Senators Percy, Mathias, Boschwitz, Pell, Glenn, and Tsongas.

The Chairman. We are pleased to welcome our guests and witnesses this morning. Few policy issues are as subject to misunderstanding and oversimplification as those the Committee on Foreign Relations are to address in hearings today and tomorrow with four panels of public witnesses on Soviet economic dependence on the West, U.S. leverage on Soviet policies through our trade policy, implications of U.S. trade policy for our West European and Japanese allies, and implications for U.S. business.

Just how "dependent" is the Soviet economy on the West? Some point to the growing volume of Soviet trade with the West, and especially to Soviet grain and equipment imports to make a case for substantial dependence. Others say that Western trade makes certain economic goals easier, faster, and cheaper for the Soviets. It is far from essential to any sector. They believe that the Soviets will, for political reasons, resist mightily any United States or Western effort to exploit what limited economic leverage we may have.

Answers to these questions are far from easy, and I hope the expertise and perspectives of each of our witnesses may help the committee. It behooves the Congress as well as the administration to try to approach U.S. economic policy toward the Soviet Union with as much care and judgment as we can muster, for much is at stake in the effectiveness of our policy toward the Soviet Union, the health of our alliances, and the strength and competitiveness of U.S. exports.

Several things are already clear to me, however. It makes no sense to grasp at trade denial scenarios just because we are frustrated with Soviet behavior and find military responses too dangerous and political protest unavailing. I yield to no one in my outspoken opposition to what the Soviets have done in Afghanistan and Poland, but I believe the fundamental test of our response has to be effectiveness.

It is not effective if the ordinary American citizen does not understand its logic.

It is not effective to try to dictate trade policy to an alliance of sovereign democracies. Policies that divide the alliance help only the Soviet Union. The question before the committee therefore is to assess the overall costs and benefits to the West of bringing economic pressures to bear against the U.S.S.R.

The CHAIRMAN. Senator Pell.

Senator PELL. Mr. Chairman, I have an opening statement which I would like to have inserted in the record stating my strong position that I think the President's pipeline policy is a folly and I hope he soon sees the reasons therefore.

The CHAIRMAN. Your statement will be inserted at this point.

[Senator Pell's prepared statement follows:]

### OPENING STATEMENT OF HON. CLAIBORNE PELL, A U.S. SENATOR FROM RHODE ISLAND

Today the Committee begins the first of 2 days of hearings on an assessment of the vulnerability of the Soviet economy to economic sanctions imposed by the West, and the effectiveness of such sanctions in alternating Soviet domestic and international policies. I hope that these hearings will provide a forum for a full and complete public discussion of one of the more controversial issues before us today.

Let me say at the outset that recent evidence makes me highly skeptical that the United States, acting unilaterally, can be effective in influencing Soviet behavior in a positive way. Quite to the contrary, I believe that the President's recent decision to expand sanctions on the sale of oil and gas related equipment and technology has only succeeded in driving a serious wedge between the United States and our most critical allies. This has given the Soviets a wonderful propaganda weapon to wield against us in Europe in attempting to convince the Europeans that the United States is insensitive to European interests, and that the real threat to world piece is the United States, and not the Soviet Union.

Were the Soviets to be seriously affected by the unilateral actions which the Administration has taken, and Soviet policy makers did in fact alter their decisions with respect to Poland or Afghanistan, then perhaps the domestic cost to American business and labor as well as the political capital expended with our allies might be worth the price. Sadly that appears not to be the case. Most experts agree that at best pipeline construction will be slowed by up to 2 years, but more likely by 6 months to 1 year. However even this construction delay won't stop the Soviets from meeting the deadline to sell gas to Europe by 1984. Given these facts, the Administration's decisions with respect to sanctions make little domestic or foreign policy sense. I therefore hope that the President too will come to realize the folly of continuing sanctions, and lift these restrictions in the near future.

It is my hope that the hearings and debate on these issues over the next 2 days will establish a record from which a more comprehensive and sensible policy for dealing with the Soviet Union both economically and politically may begin to emerge. If that is the case, then I think that this Committee will have made an important contribution to U.S. foreign policy formulation.

The CHAIRMAN. Senator Glenn, would you want to make any opening comment?

Senator GLENN. I have no formal statement, Mr. Chairman. Thank you. We had a briefing yesterday afternoon from some of the intelligence people about their views and analysis of these things. It provided us background information for this morning. We found that meeting yesterday afternoon very illuminating, and I am glad to welcome the witnesses here this morning. Thank you.

The CHAIRMAN. Thank you very much.

We are pleased to have Prof. Herbert Levine, Department of Economics, University of Pennsylvania, and Prof. Vladimir G. Treml, Department of Economics, Duke University, Durham, N.C.

Professor Levine, if you would care to proceed.

## STATEMENT OF HERBERT S. LEVINE, DEPARTMENT OF ECONOMICS, UNIVERSITY OF PENNSYLVANIA AND WHARTON ECONOMETRIC FORECASTING ASSOCIATES, PHILADELPHIA, PA.

Mr. LEVINE. Thank you, Mr. Chairman. Thank you for the privelege of being asked to address this committee.

I think that the first problem with a discussion of trade dependence of the Soviet Union or of any nation is actually the word "dependence" itself. We all would be better off if economists would stick to the term "trade participation ratios" when referring to ratios of imports and exports to total national product, for the relationship between that ratio and the dependence of a nation on the external economy lies on a continuous multidimensional scale which measures the amount of disruption that would be caused to a nation's internal economy if its external economic relations were broken.

The zero point on this scale is autarchy, and only the highest point should be referred to as dependence. Most developed economies, especially the large multiresource ones like the Soviet Union, are well within the range between these two extreme points.

Now, this concern with a use of a word, the word "dependence," is not, I hope, just the semantic quibbling of a pedantic professor. Its use, I feel, sets just the wrong tone for a discussion of the vulnerability of the Soviet Union to the exercise of economic leverage or coercion by the United States. The Soviet Union is not dependent on its trade with other nations. It engages in such trade because of the benefits it derives from it.

As with all economic decisions, benefits are weighed against costs. The benefits derived from imports are weighed against the alternative costs of producing the imported product domestically and also against the costs of exports. When such benefit-cost calculations appear to yield net gains, decisions to trade are taken. In market economies, of course, such results are achieved through the decisions of individual firms, for the most part.

It may well be that the Soviets do not make such decisions efficiently, but their aims are to reap the benefits that are possible from foreign trade. No longer are they the trade-minimizing, import-substituting nation that they were under Stalin. They now acknowledge the benefits that can be derived from foreign trade. This is evident, for instance, in many statements from Soviet leaders, administrators, and economists. These statements often ring of classical comparative cost specialization theory, but actually the kind of international specialization or, in their term, division of labor that has been developing among industrialized nations and this is pursued by the Soviets involves actually intra-industrial rather than inter-industrial specialization.

This means that trade between countries, especially in machinery and intermediate products at high levels of fabrication, usually entail specialization in narrow ranges of products within given industries, that is, intra-industrial trade, rather than in the closing down of whole economic branches or industries and complete branch specialization in each of the trading countries, as is implied by the classical theory, and as would go by the name inter-industrial trade. This clearly affects the degree of dependence of one nation on another that may be said to be represented by any given trade participation ratio.

Furthermore, the level of economic development that the Soviet economy has achieved gives it a basic core of the economy that has achieved what presumably was Stalin's aim of guaranteeing the national independence of the Soviet Union. In other words, under present conditions, expanded economic relations with the West, the capitalist countries, do not involve these capitalist countries in the basic core of the Soviet economy, which is now sufficiently developed to guarantee the independence and national security of the Soviet Union, but operate at the margin to improve the performance of this economy.

The question then for this committee, I believe, is not how dependent is the Soviet Union on trade with the West, but how beneficial is this trade to the Soviet Union, and therefore, what costs are the Soviets willing to bear to maintain these economic contacts.

Any nation, let alone one at the level of industrial development and with as rich a resource base as the Soviet Union, always has alternatives when faced with an act of economic coercion by another, say, in the form of an embargo. First of all, of course, it can seek supplies of the embargoed item elsewhere. If they are not available, it then has the choice of producing the desired imports itself, which may involve the necessity of developing the capacity to produce the product, or it may decide to do without the product and substitute something else which is or could be made available domestically. Whether it will comply with the attempted coercion depends on the net benefits of the imports when compared with the alternatives relative to the costs of compliance.

While my topic is not the formation of a leverage policy, let me say that the costs of compliance include not only the perceived disutility of the policy that the coercing nation is demanding, but also the costs of appearing to give in to the coercive action of another. That is the costs of having one's sovereignty be challenged. More on this will follow below.

The measurement of the benefits from trade is extremely difficult. Let me call to the attention of this committee the very valuable article on this subject by Michael Dohan that appeared in the 1979 Joint Economic Committee study on the Soviet economy, in which Dohan examined the commodity by commodity relationship of imports to domestic usage. Such a review is far beyond the scope of a brief statement here, but let me look at two products, indeed, the two products mentioned by Chairman Percy.

One item, of course, is grain. In the last 3 years, using an agricultural year of July to June, Soviet net imports of grain have ranged between 14 and 21 percent of domestic grain utilization, and they are forecast—by the USDA—to be at the level of 22 percent in the forthcoming July-June year of 1982-83. In better harvest years lately—that is, in the seventies—they have ranged in the 5 percent area. The Soviets have recently embarked on a major food program with the aim of improving their domestic production of food. In the meantime, and especially in light of the recent unprecedented run of bad weather and bad harvests, grain imports have clearly been of very great benefit to the Soviet economy.

Another major area where there appear to be significant benefits is the import of machinery and advanced technology from the West. There is a fair amount of controversy about just how beneficial these imports are. I am among those who believe that they have fairly substantial benefits. Much of the literature on the Soviet importation of foreign technology is based on individual case studies, and their thrust is often, I feel, misdirected. They tend to stress how poorly the Soviets handle imported technology compared with the orginating country, but even though the Soviets do not handle foreign technology nearly as well as other nations do, the foreign technology imported into the Soviet Union may still be significantly more productive than the existing domestic technology and therefore may be of substantial benefit to the Soviet economy.

In an effort to get a quantitative measure of this benefit of imported machinery, a colleague of mine, Don Green, and I several years ago did some calculations using our Soviet econometric model, and the calculations tended to show that imported machinery—from West and East—was approximately three times more productive than domestic machinery.

These quantitative results indicate a very substantial payoff, much more than the literature or the profession has accepted. Because of this and because of widespread criticism of our methodology, these results are still quite questionable, and future econometric work may yield substantially lower results. On the other hand, some recent microstudies, for example, Hanson's study of the Soviet importation of advanced fertilizer, also indicate a high benefit to the Soviets of imported technology and imported machinery.

The next question then is how much of this flow of machinery to the Soviet Union do we control. Daniel Bond, who is currently director of the centrally planned economies projects at Wharton, working with material from Treml and Kostinsky, has calculated the shares of machinery imports in the total supply of machinery to the Soviet economy. These data are presented in table 1 of my prepared statement. Generally what they show is that the share of machinery imports from the West in total machinery supplied to the Soviet economy is very low. In recent years, it hovers around 3 percent.

The share of machinery imports from the West in the machinery component of investment in the Soviet economy is higher, but the share of the U.S. in machinery imports from the West is really very low. In one year in the middle 1970's, it got up to 14 percent. It is currently at about 7 percent. Therefore, our share of Soviet machinery imports has been substantially less than 1 percent of what the Soviets use domestically.

Finally, does this mean that we have little possibility of using economic leverage or economic coercion? Again, this is not my topic, but let me just make a few comments. While the aggregate numbers indicate that the United States and the West do not have a stranglehold on the Soviet Union, it is my belief that a carefully crafted leverage policy, aimed at moderate goals—this is of key importance—you are not going to get the Soviet Union to give up any major policies, especially those they feel are important to their security, with economic leverage—conducted through quiet diplomacy rather than overt threats and sanctions, has the possibility, I feel, of affecting Soviet cost-benefit calculations enough so as to yield us some returns.

Thank you.

[Mr. Levine's prepared statement follows:]

### PREPARED STATEMENT OF HERBERT S. LEVINE

Mr. Chairman and members of the Senate Committee on Foreign Relations, the first problem with a discussion of the trade dependence of the Soviet Union (or of any nation) is the word dependence itself. We all would be better off if economists would stick to the term "trade participation ratio" when referring to the ratio of imports and exports to total national product. For the relationship between that ratio and the dependence of a nation on another or other nations is tenuous. The degree of involvement of a nation in the external world economy lies on a continuous, multi-dimensional scale, which measures the amount of disruption that would be caused to a nation's internal economy if its external economic relations were broken. The zero point on the scale is autarky, and only the highest point should be referred to as dependence. Most developed economies, especially the large, multi-resource ones, are well within the range between these two exteme points.

This concern with the use of the term dependence is not just the semantic quibbling of a pendantic professor. Its use sets the wrong tone for a discussion of the vulnerability of the Soviet Union to the exercise of economic leverage by the United States. The Soviet Union is not dependent on its trade with other nations. It engages in such trade because of the benefits it derives from it. As with all economic decisions, benefits are weighed against costs. The benefits derived from imports are weighed against the alternative costs of producing the imported product domestically and also against the costs of exports. When such benefit-cost calculations appear to yield net gains, decisions to trade are taken. (In markets economies, such results are achieved through the decisions of individual firms).

It may well be that the Soviets do not make such decisions efficiently. both their aims are to reap the benefits that are possible from foreign trade. No longer are they the trade-minimizing, import-substituting nation that they were under Stalin. They now acknowledge the benefits that can be derived from foreign trade. This is evident, for instance, in the following statement of the Soviet Minister of Foreign Trade, N. S. Patolichev: "In developing economic ties with [the West], our country recieves an opportunity to make fuller and more rational use of its own resources and possibilities, and at the same time to acquire, by way of commercial exchange, goods of other countries that are not produced in our country or whose production would cost more than it does to import them. Thus, foreign economic ties offer a more efficient solution to a number of problems arising in the course of economic construction.[1]

Furthermore, while this statement rings of classical, comparative cost trade specialization theory, the kind of international specialization or division of labor that has been developing among industrialized nations and that is pursued by the Soviets involves intra-industrial rather than inter-industrial specialization. This means that trade between countries, especially in machinery and intermediate products at high levels of fabrication, usually entails specialization in narrow ranges of products within given industries (intraindustrial trade) rather than in the closing down of whole economic branches or industries and complete branch specialization in each of the trading countries (interindustrial trade). This clearly affects the degree of dependence of one nation or another that may be said to be represented by a given trade participation ratio.

In addition, the degree of Soviet dependence on foreign trade is affected by the level of economic development that it has achieved. Stalin's original objective of acquiring sufficient economic development to guarantee the national independence of the Soviet Union has been achieved. The development of economic relations with capitalist nations at this stage extends beyond this core of economic power but does not endanger it. In other words, under present conditions expanded economic relations with the West do not involve capitalist countries in the basic core of the Soviet economy (which is now sufficiently developed to guarantee the independence and national security of the Soviet Union), but operate at the margin to improve the performance of the Soviet economy.

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[1] Pravda, Dec. 27, 1973, p. 4. [Translation in "Current Digest of the Soviet Press," 25:52, Jan. 23, 1974].

The question then becomes not how dependent is the Soviet Union on trade with the West, but how beneficial is this trade to the Soviet Union, and what costs are they willing to pay to maintain it. For any nation, let alone one at the level of industrial development and with as rich a resource base as the Soviet Union, always has alternatives when faced with an act of economic coercion by another, say in the form of an embargo. First of all, of course, it can seek supplies of the embargoed item elsewhere. If they are not available, it has the choice of producing the desired imports itself, which may involve the necessity of developing the capacity to produce the product. Or it may decide to do without the product and substitute something else which is or could be made available domestically. Whether it will comply with the attempted coercion depends on the net benefits of the imports, when compared with the alternatives, relative to the cost of compliance. (The costs of compliance include the perceived disutility of the policy the coercing nation is demanding, and the costs of appearing to give in to the coercive action of the other nation. But more on this below.)

The measurement of the benefits from trade is extremely difficult. This is why, I suppose, available measures such as trade participation ratios are resorted to. The issue, however, is not just how much trade, but of what benefit is it. Such a question requires the investigation of individual and groups of imported products. This is not the place for a detailed examination of the commodity composition of Soviet imports and their relation to domestic use. In this regard, let me refer the Committee to the valuable article on this subject by Michael Dohan that appeared in the 1979 Joint Economic Committee study on the Soviet economy.[2]

One imported item which is of great benefit to the Soviet Union is, of course, grain. In the last three years (using July/June years), net imports of grain have been between 14 and 21 percent of domestic grain utilization, and they are forecast at the level of 22 percent in 1982/83 (in better harvest years lately they have been in the 5 percent range).[3] The Soviets have recently embarked on a major food program with the aim of improving their domestic production of food. In the meantime, and especially in light of the recent unprecedented run of bad weather and bad harvests, grain imports have been of great benefit.

Another major area where there appear to be significant benefits is the import of machinery and advanced technology from the West. There is a fair amount of controversy about just how beneficial the imports are. I am among those who believe they have fairly substantial benefits. Much of the literature on the Soviet importation of foreign technology is based on individual case studies and their thrust is often misdirected. They tend to stress how poorly the Soviets handle the imported technology compared with the originating country. But even though the Soviets do not handle foreign technology nearly as well as other nations do, the foreign technology imported into the Soviet Union may still be significantly more productive than the existing domestic technology and therefore may be of substantial benefit to the Soviet economy.

With the aim of deriving a quantitative estimate of the relative productivity of imported and domestic machinery in the Soviet Union and the grains from imported technology, I was involved several years ago in a series of calculations conducted using our Soviet Econometric Model (SOVMOD).[4] The model calculations indicated that in the early 1970's, imported industrial machinery (from the West and the East) was approximately three times as productive as domestic industrial machinery. These quantitative results indicate a fairly substantial payoff of imported machinery and technology, more than might have been assumed from the anecdotal literature. Because of this and because of widespread criticism of our methodology, the calculations are controversial; it is quite possible that future econometric work will yield substantially lower results. On the other hand, some recent microeconomic analyses of Soviet imports of advanced fertilizer technology also indicate substantial gains to the Soviet economy.[5] If the order of magnitude of these calculations is generally accurate and, more important, if they reflect Soviet leader's perceptions of the gains from technology transfer, then the Soviet desire for technology imports from the West may be quite strong.

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[2] Michael R. Dohan, "Export Specialization and Import Dependence in the Soviet Economy, 1970-77," in U.S. Congress, Joint Economic Committee, "Soviet Economy in a Time of Change," Vol. 2 (Washington, D.C.: U.S. Government Printing Office, 1979), pp. 342-395.

[3] U.S. Department of Agriculture, *Foreign Agriculture Circular (Grains)*, Washington, D.C. July 15, 1982, p. 20.

[4] Donald W. Green and Herbert S. Levine, "Macroeconometric Evidence of the Value of Machinery Imports to the Soviet Union," in John R. Thomas and Ursula M. Kruse-Vaucienne, eds., *Soviet Science and Technology*, George Washington University (Washington, D.C.: National Science Foundation, 1977), pp. 394-424 (reprinted in *Survey 23*, no. 2 [Spring 1977/78]: 112-126). See also the earlier paper: Green and Levine, "Implications of Technology Transfers for the U.S.S.R.," *East-West Technology Co-operation* (Brussels, 1976).

The next question is how much of these benefits do we control. My colleague, Daniel Bond, Director of the Centrally Planned Economies Projects of Wharton Econometrics, working with material from Treml and Kostinsky, has calculated the shares of machinery imports in the total supply of machinery to the Soviet economy (production plus imports minus exports).[6] These data are presented in table 1. They show that on an aggregate scale, Soviet imports of machinery from the West do not loom large in total machinery supply, though they are larger as [illegible] share of the machinery component of annual investment, maintaining a level of 8–10 percent in the period 1975–1980. These data give an indication as to the extent of reallocation of machinery and equipment among alternative uses that would be required if the Soviets were to be cut off from Western supplies. Since, at most, only 3 percent of total machinery supply would be affected, it appears likely that the Soviets could, by changing their pattern of domestic utilization and trade with Eastern Europe, shield priority uses of machinery and equipment such as domestic investment or military procurement from significant impact. Also, since most of the machinery imports from the West are used as producer durables, the full impact of an embargo of Western machinery trade would not be felt immediately. It would appear over time in delays in completion of investment projects, and in lower output, to the extent that substituted machinery and equipment (produced domestically or imported from the socialist countries) was of lower quality than that produced in the West.

TABLE 1.—SHARES OF MACHINERY IMPORTS IN SOVIET ECONOMY

[In percent]

| | Total supply | From the West | From the West, total supply | Domestic investment | United States imports from the West |
|---|---|---|---|---|---|
| 1965 | 4 | 17 | 1 | 3 | 1 |
| 1966 | 3 | 20 | 1 | 3 | 1 |
| 1967 | 4 | 21 | 1 | 3 | 1 |
| 1968 | 5 | 24 | 1 | 4 | 1 |
| 1969 | 5 | 27 | 1 | 4 | 3 |
| 1970 | 5 | 25 | 1 | 4 | 2 |
| 1971 | 5 | 23 | 1 | 3 | 3 |
| 1972 | 5 | 23 | 1 | 4 | 4 |
| 1973 | 5 | 25 | 1 | 4 | 12 |
| 1974 | 6 | 26 | 2 | 5 | 10 |
| 1975 | 7 | 38 | 3 | 9 | 13 |
| 1976 | 8 | 40 | 3 | 10 | 14 |
| 1977 | 7 | 37 | 3 | 10 | 8 |
| 1978 | 9 | 31 | 3 | 10 | 6 |
| 1979 | 8 | 30 | 3 | 9 | 7 |
| 1980 | 8 | 29 | 2 | 8 | 7 |

The entire discussion so far has been in terms of the total West. It can be seen from the last column of table 1, the United States does not play a dominant role in Soviet imports of machinery from the West. At its height in 1976, we accounted for 14 percent of such imports; we are now half of that. Therefore, we normally account for considerably less than 1 percent of Soviet machinery supply and of Soviet producer durables.

Does this mean that the United States and the West have no economic leverage on the Soviet Union? While this is not my topic for these hearings, let me make a few comments. First of all, there is grain. But even with regard to Soviet machinery imports from the West, though the aggregate role is small, in particular products especially those of very high technology, the benefit of trade to the Soviet Union is substantial. What the aggregate numbers indicate is that the United States and the West do not have a stranglehold on the Soviet Union. But it is my belief that a carefully crafted leverage policy, aimed at moderate goals, conducted through quiet diplomacy, has a possibility of affecting Soviet cost-benefit calculations enough so as to yield us some returns.[7]

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[5] See Philip Hanson, "The Impact of Western Technology: A Case Study of the Soviet Mineral Fertilizer Industry," in P. Marer and J. M. Montias (eds.), *East European Integration and East-West Trade* (Bloomington: Indiana University Press, 1980).

[6] See Daniel L. Bond and Herbert S. Levine, "The Soviet Machinery Balance and Military Durables in SOVMOD," prepared for the U.S. Congress, Joint Economic Committee, 1982 Compendium of Papers on the Soviet Economy, forthcoming.

First, a multiplicity of possible objectives may be attained through a program of economic leverage. These objectives range from those of great importance to the United States to those of lesser importance. Much of the confusion in the debates on leverage arises from the failure to delineate objectives and from the oft-made implicit assumption that if U.S. political policy objectives of greatest importance cannot be achieved, then the development of an economic leverage program is not worth pursuing. On the contrary, a well-formulated, balanced foreign policy involves instruments to achieve a range of different objectives.

Second, if the application of leverage is to be effective, it must consider certain salient Soviet sensitivities. Soviet leaders are concerned with issues of political legitimacy; therefore, they are particularly sensitive to any threats to the sovereignty of the Communist government. Thus the tactic of a quiet, diplomatic application of leverage is preferable to a declaratory, overt application of leverage.

Third, the fact that major policy decisions in the Soviet Union are made by a small group of party leaders in the Politburo offers some advantages to the exercise of leverage by the United States. Since the Politburo is responsible for all major policy decisions, it has the power to deliver on agreements, including unpublicized agreements, with the United States. Moreover, since the Soviet economic bureaucracy resists change and innovation, the Soviet political leaders—if they are to maintain national power parity with the United States—must exert pressure from above to introduce and spread new methods and new technology. Thus their commitment to the import of advanced foreign technology is great. Operating as they do in the political sector, these pressures take the form of high priorities and campaigns usually focused on few major projects that receive substantial public attention and become identified with senior party officials. As a consequence, Soviet leaders would be somewhat vulnerable to a U.S. leverage effort directed toward such major projects.

Fourth, the role of middle- and lower-level Soviet party and state officials regarding a Soviet policy response to a U.S. leverage initiative is heightened by certain administrative practices in the Soviet Union. Specific agent responsibility, continuous monitoring of agent performance, and the awarding of material and status rewards and penalties in relation to performance encourage responsible agents to pursue the means of achieving their assigned tasks. To the extent that imports of U.S. machinery and technology help in this regard, Soviet administrators, especially at the ministerial level, may support the maintenance of expanded economic relations with the United States. This is a significant aspect of the Soviet system that contributes to the potential for the exercise of economic leverage by the United States.

Fifth, in choosing a leverage instrument, it would be good if it were possible to vary its application, to increase or decrease its scale quickly and easily. For example, this is true to credit, especially if the credit is being provided by a U.S. Government agency (such as the Eximbank). On the other hand, it is not true of MFN status. In addition, leverage instruments should be capable of responding to the interests of different groups in the United States. That is, if grain exports are to be used in a leverage program the government must have the means of maintaining U.S. farm income if it intends to reduce such exports.

Sixth, the objectives and policies of different agencies within the U.S. Government and of the public and private sectors in the United States must be coordinated in order to operate an effective leverage program.

And finally, it should by now be clear to all, that multilateral coordination between the United States and its allies regarding policy toward economic relations with the U.S.S.R. is of major importance. Since in many areas the U.S.S.R. can substitute relations with other developed industrial nations for those with the United States, it is vital that the United States pursue coordinated policies with other

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[7] The following remarks are drawn from: Herbert S. Levine, Francis W. Rushing, and Charles H. Movit, "The Potential for U.S. Economic Leverage on the U.S.S.R.," Comparative Strategy, Vol. 1, No. 4, 1979, pp. 371-404.

See also, H.S. Levine, "Systemic Constraints on Economic Leverage: Communist/Command Systems," Conference on Strategic Dimensions of Economic Behavior, Foreign Policy Research Institute, Washington, D.C., February, 1982, forthcoming.

Western countries in order for there to be any chance of an effective leverage policy.

The CHAIRMAN Does that complete your oral testimony?

Mr. LEVINE. Yes, sir.

The CHAIRMAN. I wanted to comment that Professor Levine has been a consultant to the Wharton School in its econometric models to which he has referred in his testimony. They do use a different measure of Soviet trade value and independence with somewhat different results, and we might get into that in our questioning.

Our next witness, Professor Treml, is a coauthor of a forthcoming study for the U.S. Census Bureau of the Department of Commerce which measures Soviet trade volume in domestic ruble prices rather than foreign trade rubles, and calculates the higher recent volume of Soviet foreign trade than commonly assumed.

Professor Treml.

## STATEMENT OF VLADIMIR G. TREML, DEPARTMENT OF ECONOMICS, DUKE UNIVERSITY, DURHAM, N.C.

Mr. TREML. Mr. Chairman, it is a privilege to appear before you this morning.

My name is Vladimir Treml, and I am a professor of economics at Duke University. I am also employed part time as an expert with the Census Bureau, and I have contributed to several studies done under its auspices.

I am appearing here today not as a representative of that organization, but as a private individual, and the opinions expressed here are entirely my own. For the past several years, both at Duke University and at the Census Bureau, I have been engaged in research on the role of foreign trade in the Soviet economy.

A major study of Soviet foreign trade was recently completed at the Census Bureau by my colleague, Barry Kostinsky, and myself. The main focus of this study is in estimating the values of Soviet exports and imports and domestic prices. That is, actual transaction prices at which imported goods are sold to Soviet buyers and which are received by Soviet manufacturers of goods for export.

Having calculated the value of foreign trade in domestic prices, we were able to compute the so-called foreign trade participation or dependency ratios, that is, the shares of exports and imports in Soviet national income. Historically, the generally accepted view of the Soviet economy has been that it is largely self-sufficient, as evidenced by the low participation ratios estimated for it by Western economists.

While these estimates which have ranged from 3 to 5 percent each for exports and imports may have been accurate throughout the early 1960's, they have increasingly, in my opinion, reflected inadequate data or estimation procedures. In particular, many analyses do not properly take into account the external-internal price differences that rest in our study.

On the basis of values for trade through 1978 derived in our studies and of estimates for 1980 made by applying the same procedures to more recent data, we reach the following conclusions. The export participation ratio increased somewhat from 6.3 percent of national income in 1970 to 6.8 percent in 1978 and 6.9 percent in

1980. The import participation ratio rose from 8.6 percent in 1970 to 18.6 percent in 1978, reaching 20 percent in 1980.

That is, it increased by a factor of about 2.5 in 10 years. Preliminary estimates for 1982 based on first-quarter trade statistics and our projections of national income indicate the shares will continue to rise. It should be noted that these ratios are based on the Soviet definition of national income. Were we to use the Western concept of gross national product as a base, the 1980 export-participation ratio would be about 5.2 percent, and the import ratio about 15 percent.

Some specialists have proposed recently that the measure of Soviet dependence on trade on Soviet internal prices does not reflect the true costs of resources, and that instead the measure should be expressed in dollar prices.

I have carefully evaluated this proposition. And, in my considered judgment, the use of dollar prices is inappropriate and would produce highly distorted results.

While our report concerns only aggregate export and import values for most years, we have collected additional information on the role of imports in particular areas of the Soviet economy. It appears that imported machinery accounts for 15 to 20 percent of all newly installed equipment each year, and that about 15 percent or more of personal consumption in the Soviet Union derives from imported consumer goods and agricultural products.

In some specific areas and branches of the Soviet economy, such as the chemical industry, the woodworking and the paper industries, and the plastics industries, imported machinery plays a singularly important role as to imports of grain and other food products. Based on this analysis, I conclude that the Soviet participation in foreign trade and Soviet dependence on foreign trade rose dramatically in the 1970's. Combined with other evidence, such as developing direct and indirect links between the domestic price system and the world market prices, I submit that the old perception of the Soviet economy as self-sufficient and isolated from the rest of the world should be revised.

The Soviet economy has become relatively much more open to external market forces and displays significant dependence on external markets. There is clearly no one-to-one correspondence between the rising Soviet dependence on trade and the vulnerability of the Soviet economy to external forces. However, I think it is reasonable to conclude that the development of Soviet foreign trade in the last 10 to 12 years has resulted in greater susceptibility to economic sanctions than was true in the past, and than has been recognized by Western specialists.

I wish to stress that this analysis and conclusions go no further than this, and in no way address the question of the advisability, effectiveness, costs, or consequences of sanctions against the U.S.S.R. It should be noted that the issue of sanctions was entirely outside of the analysis I conducted in collaboration with the Bureau of the Census, but I would like to add these comments on the subject.

There is no single yes or no answer to the question of the effectiveness of economic sanctions. There is, in fact, a complex matrix of possible scenarios. On the one hand, there is a whole range of sanctions available to the United States and its allies, varying from selective restrictions on exports of specific products to full-scale economic warfare. On the other hand, there must be a whole range of possible concessions the Soviet leadership would be willing to make depending on the economic costs of Western sanctions to them.

I believe that the whole issue requires much more study. I would like to mention one aspect of Soviet dependence on the West which is often misinterpreted because of our lack of understanding of all the factors involved. About 65 percent of all Soviet imports come from Socialist and Third World countries, and this, of course, limits the effectiveness of the economic leverage available to the West. In the case of machinery, this share is 70 percent.

However, simple statistics like this do not tell the entire story. The Socialist trading partners of the U.S.S.R. are also partially dependent on trade with the West, and they import intermediate machinery goods, such as machinery components, ball bearings, instruments, and control devices, and electronics. A certain share of these intermediate products goes into the production of machinery exported by the Socialist countries to the U.S.S.R.

Thus, the Western technology embodied in Soviet imports is higher than described by these simple ratios, and the leverage available to the West is therefore more significant.

This concludes my testimony, Mr. Chairman. I would be pleased to answer any questions.

I also would like, Mr. Chairman, if I could place into the record a more technical study of about 10 pages in length supporting some of these statistics which I cited today.

The CHAIRMAN. We will incorporate that in the record. I know that we will find it interesting.

[The material referred to follows:]

[From the Wharton Econometric Forecasting Associates, Aug. 6, 1982]

## MEASURING THE ROLE OF FOREIGN TRADE IN THE SOVIET ECONOMY

(By Vladimir G. Treml)

The July 14 CPE Current Analysis focused on recent U.S. Department of Commerce comments concerning the openness of the Soviet economy to foreign trade. In this issue Professor Vladimir Treml of Duke University, one of the authors of the study which the Commerce Department used as a basis for its comments, responds.

In a recently completed study done under the auspices of the Bureau of the Census[1] my colleague and I offer estimates of Soviet foreign trade valued in domestic prices and measurements of Soviet dependency on foreign trade.

The data are summarized below.

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[1] Vladimir G. Treml and Barry L. Kostinsky, The Domestic Value of Soviet Foreign Trade, Foreign Demographic Analysis Division, U.S. Bureau of the Census, (Washington, D.C., Government Printing Office, forthcoming, fall 1981). The data for 1980 are not in the source cited (in which the data series end with 1978) but were roughly estimated by me by the methodology developed and documented in the study.

## SOVIET FOREIGN TRADE

[Billions of current rubles]

| | Exports | | | Imports | | |
|---|---|---|---|---|---|---|
| | Foreign trade rubles | Domestic prices | Percent of NMP [1] | Foreign trade rubles | Domestic prices | Percent of NMP [1] |
| 1960 | 5.0 | 5.3 | 3.7 | 5.1 | 12.0 | 8.3 |
| 1965 | 7.4 | 8.4 | 4.3 | 7.2 | 15.7 | 8.1 |
| 1970 | 11.5 | 18.3 | 6.3 | 10.6 | 24.9 | 8.6 |
| 1975 | 24.0 | 22.9 | 6.3 | 26.7 | 54.4 | 15.0 |
| 1980 | 49.6 | 31.8 | 6.9 | 44.5 | 92.3 | 20.1 |

[1] Editors note: Net Material Product is a measure of national product comparable to GNP minus most services and depreciation. It is approximately three-fourths of what Soviet GNP would be.

In our Bureau of the Census study and elsewhere we endeavor to show that the Soviet dependence on foreign trade measured in domestic prices is much greater than perceived earlier and that it was rising rather dramatically in the 1970's. However, our measure of Soviet dependence on foreign trade should not be used as an absolute index of Soviet vulnerability to external forces but as evidence of rapidly growing vulnerability. The fact that only about one-third of Soviet imports (when measured in dollars) comes from the West clearly limits the effectiveness of economic leverage available to the West.

Our results were critically examined in the Wharton Current Analysis of July 14, and I would like to discuss some of the issues raised.

The Wharton newsletter lists two empirically feasible measures of a country's foreign trade dependency: The ratio of exports or imports (or of the sum of the two) measured in comparable world market prices to national income measured in the same world market prices; the ratio of exports or imports measured in actual domestic prices to national income measured in domestic prices.

Because of the well-known shortcomings of domestic Soviet prices the Wharton newsletter suggests that the first measure is by far the preferable one and that the second measure "does not provide good information on the dependence of the Soviet economy on foreign trade."

Wharton's argument in favor of world market prices is that these are "scarcity prices indicative of opportunity cost of different commodities on a worldwide basis" which, of course, is difficult to object to. In the absence of a measure of Soviet GNP in world market prices, the Wharton newsletter proposed using as a "substitute" the dollar value of Soviet GNP as estimated by the CIA. The Soviet dependency ratios are then calculated on the basis of actual dollar transaction prices of Soviet exports and imports (adjusted for price dislocations in intra-CMEA trade). Calculated in this manner, for 1980 the exports amount to 6.0 percent of GNP and imports 4.1 percent.

One can start by arguing that, even if we were to have a complete knowledge of all necessary Soviet and U.S. price and quantity data for comparable goods, the Soviet GNP converted to U.S. dollar prices could be hardly said to reflect world price relatives. Because of the dominant position of the United States in the world economy, U.S. domestic prices of goods traded internationally are probably close to world market prices. However, a large subset of U.S. goods and services is not traded outside of the country and the prices of this subset do not reflect worldwide market forces. But, this is not the end of the story.

One of the strongest arguments against the use of dollars or world market prices is the index number problem. It will be recalled that both theoretical and applied studies suggest that, as long as prices and quantities are inversely related, comparisons of national aggregates (GNP, NMP) of two different countries will vary depending on whether prices of one or the other country were used. Thus, the ratio of national incomes of countries A and B will be higher when measured in B prices than when measured in A prices. For instance, the ratio of Soviet to U.S. GNP for 1976 was estimated as 73.7 percent when measured in dollars and only 49.5 percent when measured in rubles.[2][3]

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[2] Imogene Edwards, Margaret Hughes, and James Noren, "U.S. and the U.S.S.R.: Comparisons of GNP," in Joint Economic Committee,, U.S. Congress," "Soviet Economy in a Time of Change," Volume 1, (Washington, D.C.: Government Printing Office, 1979), p. 378.

Continued

But, in order to fully evaluate the distortive effect of the index number problem on the dependency ratio of the foreign trade/national income type we must look at the numerator as well as the denominator. The proof is rather cumbersome, but it should be intuitively clear that the logic of the index number effect applies to foreign trade. Countries export commodities which are relatively abundant at home and that are, therefore, relatively inexpensive and import commodities which are scarce and expensive at home. Since the outside world buys the exports and sells the imports to the country we are examining, the relative scarcities and prices on the world market must move, therefore, in opposite directions from domestic scarcities and prices

Here we must introduce a complicating factor. The Soviet ruble is inconvertible and the U.S.S.R. is trading in world markets in terms of external prices, which are different from domestic prices. Historically, the U.S.S.R. tried and almost always succeeded in balancing her commodity trade in external prices which also meant that the foreign trade was not balanced in domestic prices. I will return to this point later, but in the meantime we can note that it can be shown that, for a country which balances its trade in external prices, the foreign trade dependency measure calculated as the ratio of the sum of exports and imports and national income will always be lower when expressed in external prices as compared to the ratio based on internal prices.[4]

As a rule, therefore, the index number effect is compounded in the case of foreign trade/national income measurement, as the denominator is overstated and the numerator is understated.

There are other compelling arguments against the use of dollar prices in the measurement of the Soviet dependency ratio.

The Soviet GNP in dollars used in the Wharton newsletter was estimated by the CIA. I have worked with these estimates and in my opinion they are quite good both in terms of the methodology and accounting conventions used and in the meticulously careful collation and adjustment of the original data. But, they are still estimates and given the lacunae and uncertainties of Soviet statistics, they are rough estimates with benchmark years being somewhat better and the estimates for other years suffering from price-adjustment and other problems. Thus, the accuracy of the denominator for the dollar measure of the dependency ratio is rather uncertain or at least cannot be seriously viewed as accurately showing Soviet GNP in world market prices.[5]

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[3] In order to partially correct for the index number effect, CIA analysts convert the estimated ruble component of Soviet GNP into dollars by applying the "average purchasing power ratio of the dollar and the ruble" calculated as a geometric mean of individual ruble-dollar ratios weighted by both United States and Soviet expenditure weights (CIA NFAC, "Handbook of Economic Statistics", Washington, D.C. 1981, p. 29.). The final effect, in terms of the example given above, would be that the Soviet/U.S. GNP ratio in dollars (or, in rubles, as with this approach there is no difference) is 60.4 percent.

This adjustment is justified for the purpose of U.S.-Soviet comparison, but is undesirable for the dollar measure of Soviet GNP used by Wharton. The degree of overstatement of the Soviet GNP produced by the conversion to dollar prices is reduced but, on the other hand, the dollar prices are now even further away from world market prices.

[4] An interesting point is that the export/income ratio will be higher in external prices and the import/income ratio will be higher in domestic prices. The ratio of the sum of exports and imports will always be higher in domestic prices. The measurements offered in the Wharton newsletter bear this out. Exports are 6 percent of Soviet GNP in dollars compared with 5.2 percent when measured in rubles. Imports based on dollars are 4.1 percent and 15 percent when based on ruble prices.

[5] It is interesting to note that, bearing all these problems in mind, the authors of the CIA study specifically ask the readers not to use the Soviet dollar GNP estimates in conjunction with the Soviet foreign trade data in dollars. (CIA NFAC, "Handbook of Economic Statistics," Washington, D.C. 1981, p. 29.)

One other factor must be taken into account. Regardless of whether we use ruble or dollar prices, the Soviet foreign trade flows must be expressed in purchasers' prices because GNP and NMP are measured in purchasers' prices. The dollar values of foreign trade used in the Wharton example are as recorded in Soviet sources, i.e., exports are valued FOB Soviet border and imports are FOB port of foreign departure. The problem of correct valuation of exports is moot, but it is quite clear that the value of imports should have been adjusted upward to reflect the cost of transportation and distribution between the Soviet border and the final consumer. Omission of these charges, therefore, understates the value of imports. (Approximate estimates indicate that transportation and distribution charges amounted to about 10 percent of the value of imports measured in domestic purchasers' prices in 1972. It is difficult to say what the charges would have been in 1980 or in dollar prices.)

The measure of dependency on foreign trade based on exports and imports in domestic prices and on official Soviet figures for national income (Net Material Product) has, in my view, several advantages.

The foreign trade flows are measured in actual final transaction prices, i.e., prices at which they are recorded in national income accounts. Exports are measured in prices received by export manufacturers and imports are recorded in prices at which they were purchased by final consumers.

All the shortcomings of the Soviet price system and idiosyncrasies of Soviet national income accounting notwithstanding, we know what we are dealing with and we are operating with value magnitudes which are used in the U.S.S.R. Soviet prices are, after all, not just random numbers and totally irrational. Domestic prices, particularly domestic prices of exports and imports, regardless of how much they depart from scarcity prices, are set by Soviet authorities and therefore reflect the priorities of these authorities.

It is now quite apparent that the Soviet domestic price system is no longer fully insulated from world market forces. In the 1967 and in subsequent price reforms, Soviet price authorities attempted, albeit with mixed results, to move Soviet price relatives closer to world market prices. Much more research will be required, but it is quite clear that at least some domestic prices are influenced by or are directly linked to world market prices.

It would be helpful to touch upon the issue of accounting of foreign trade flows as it bears directly on the problem of evaluation of exports and imports.

The July 14 Wharton newsletter questioned the inconsistency perceived in our study which "implied an external trade deficit at domestic prices of some 60 billion rubles and a 5.2 billion foreign trade ruble export surplus at the same time." [6]

It must be remembered that the Soviet ruble is inconvertible and foreign trade is conducted at external prices and in currencies of other countries. Therefore, the Soviet Union has two foreign trade balances—the one in external values indeed showing an export surplus in various external currencies converted by means of the official exchange rate to 5.2 billion so-called "foreign trade rubles," and the second showing the excess of revenues of some 60 billion rubles derived from sales of imports to domestic consumers less domestic costs of exports. The latter is thus not a "trade deficit" in a usual sense of the word, but a surplus realized from price differences and constituting a rather handsome source of revenue for the state treasury.

The explanation of the persistent and significant excess of revenues from imports over the costs of exports would be beyond the scope of this note. But, we should note that in addition to the usually cited factors such as price differences, difference in quality, and turnover taxes, the export-import imbalance in domestic prices is the result of the Soviet traditional policy of balancing the trade in external values. The actual magnitude of the gap depends on the structure of foreign trade and the prices. For instance, I expect that, as the result of the 1982 Soviet price reform, the gap will be significantly smaller.

The existence of two trade balances with different signs is thus fully consistent with Soviet national income flows. In fact, it makes the use of domestic values of Soviet exports and imports even more important as they reflect the tie-in between foreign trade and the state budget of the U.S.S.R.

Domestic values of exports and imports are thus real transaction values fully consistent and integrated with other transaction flows of the Soviet economy and their shares in national income are an important measure of Soviet dependence on foreign trade.

The measurement of dependence on foreign trade by the ratio of exports and imports to GNP in dollars appears to be inappropriate for most analytical purposes because of the downward bias resulting from the index number effect and uncertainties surrounding the estimates of Soviet GNP in dollars, particularly the uncertainties concerning the correspondence between dollar prices used in the Soviet GNP estimates and world market prices.

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[6] The July 14 newsletter goes on to say that the export surplus is even greater at comparable world market prices—an equivalent of $27.2 billion. This estimate is difficult to accept and its nature illustrates very well the problems of dealing with artificial values. The $27.2 billion figure was arrived at by repricing Soviet exports at average world market prices instead of lower prices charged by the Soviet Union in trade with Comecon nations. Knowing how carefully Wharton estimates are made I have no doubts concerning the accuracy of the estimate. But, what does it mean? Could the Comecon nations pay some additional $20 billion for Soviet imports, were they priced at world levels? Is demand for imports from the U.S.S.R., even for energy imports, perfectly inelastic? I submit that if the U.S.S.R.-Eastern Europe trade were to be actually shifted to world prices the whole trade system would probably collapse and, after a painful realignment, a completely different set of world market prices would emerge.

## APPENDIX: EDITOR'S REPLY

Professor Treml objects to Wharton's calculation of Soviet foreign trade dependence on three grounds, namely; The numerators in export/GNP and import/GNP ratio are respectively biased upward and downward because of an "index number problem," i.e., hypothetical Soviet scarcity prices should be lower than world market prices for exports and higher for imports; the denominator in both of the above ratios is biased downward because he feels that Soviet dollar GNP at "world market prices" would be lower than Soviet dollar GNP at U.S. prices estimated by CIA (note: for 1980 CIA estimated Soviet dollar GNP at 53 percent of U.S. GNP); and Soviet imports should be measured on a c.i.f. rather than a f.o.b. basis in order to express trade flows in purchaser's prices.

Since Professor Treml does not make suggestions as to the suspected magnitude of bias in our calculation except in the third case, we will try to satisfy at least the latter two of his objections by making the following adjustments in our calculation of Soviet export/GNP and import GNP ratios: Instead of using a CIA estimate of 1980 Soviet dollar GNP of $1,392 billion, we shall assume that Soviet dollar GNP at world market prices was a mere 40 percent of U.S. GNP or $1,050 billion (note: this is intentionally an absurdly low estimate since as Professor Treml points out already in 1976 the ratio of Soviet to U.S. GNP measured in rubles was 49.5 percent); and we shall increase the value of Soviet imports from Eastern Europe by 5 percent and from all other regions by 10 percent in order to convert Soviet data from a f.o.b. to a c.i.f. basis.

These two changes would have the following effect on our calculation of Soviet foreign trade dependence in 1980 presented in our July 14 Current Analysis:

### GNP RATIO

[In percent]

| Region of trade | Export | | Import | |
|---|---|---|---|---|
| | At actual transactional prices [1] | At world market prices | At actual transactional prices [1] | At world market prices |
| Eastern Europe | 3.07 | 3.67 | 2.94 | 1.94 |
| Other Socialist countries | .87 | .99 | .73 | .55 |
| Socialist countries | 3.94 | 4.66 | 3.67 | 2.49 |
| Developed West | 2.33 | 2.33 | 2.54 | 2.54 |
| Developed countries | 1.01 | 1.01 | .82 | .82 |
| Nonsocialist countries | 3.34 | 3.34 | 3.36 | 3.36 |
| World | 7.28 | 8.00 | 7.03 | 5.85 |

[1] Soviet ruble trade with socialist countries was converted into dollars at the official dollar/ruble exchange rate of $1.5406 per 1 ruble.

The above results lead us to the following conclusions: Soviet exports comprise 8.0 percent (7.3 percent without adjustment for price bias in socialist country trade) of Soviet dollar GNP compared to 5.2 percent estimated by Professor Treml; Soviet import/GNP ratio is 5.8 percent (7.0 percent without adjustment for price bias in socialist country trade) compared to 15 percent estimated by Professor Treml; and given the mere 2.8 point discrepancy in two estimates of export dependence which Professor Treml would attribute to the "index number problem," it is hard to accept the discrepancy of 9.2 points between the two estimates on the import side as explainable by the "index number problem" alone. If we assume, for the sake of argument, a downward bias of 50 percent in our calculation, then our estimate of import/GNP ratio would still be at most 8.8 percent—less than three-fifths of Professor Treml's estimate.

We would like to emphasize that while we agree with Professor Treml's observations that the ratio of Soviet trade to national product grew rapidly during most of the 1970's, we would not characterize any of the above figures as an index of Soviet vulnerability to external forces. The most relevant figure in the above table for the discussion of sensitivity of the Soviet economy to sanctions is the dependence of the Soviet economy on imports from the developed West. And this is shown to have reached only 2.5 percent by 1980. We fail to see how one can conclude from this that the Soviet economy is vulnerable to Western economic sanctions in a global—not micro—sense.

[From the Wharton Econometric Forecasting Associates, July 14, 1982]

## DEPENDENCE OF SOVIET ECONOMY ON FOREIGN TRADE

On July 12 the Bureau of the Census released a study of dependence of the Soviet economy on foreign trade prepared by the Census Bureau's Barry L. Kostinsky and Vladimir G. Treml of Duke University. The purpose of the study was to estimate the value of Soviet exports and imports in domestic Soviet prices instead of the actual transaction prices that prevail in foreign trade (world market prices for most of the trade with the developed West and developing countries, special intra-CMEA prices for trade with Eastern Europe, and a mix of the first two sets of prices for trade with other socialist countries).

The two main results of the Kostinsky-Treml study pertaining to year 1980 are: Soviet exports valued at domestic Soviet prices amounted to about 32 billion domestic rubles or 7 percent of Soviet national income (net material product); Soviet imports valued at domestic Soviet prices amounted to about 92 billion domestic rubles or 20 percent of Soviet national income.

Commenting on the results of the study, the Census director Bruce Chapman said: "The new analysis shows that the Soviet Union is more open to the influence of international market forces than many people have believed. That, in turn, suggests greater Soviet vulnerability to economic sanctions than has been understood up to now." The press, such as the New York Times, tended to interpret the findings as supportive of the view of the Defense Secretary Weinberger, who has maintained that the sanctions would prove effective in denying the Soviet Union a source of hard currency, from the sale of gas, that could be used for armaments.

The problem with the above interpretations of the Kostinsky-Treml study is that they imply that the correct measure of the dependence of the Soviet economy on foreign trade is the ratio of exports or imports measured in domestic prices to national income measured in domestic prices. We believe that this is not so and that, in fact, out of the three possible measures, the above measure is the poorest.

There are three possible simple aggregate measures of a country's foreign trade dependence: The ratio of exports or imports (or the two combined) measured at domestic scarcity (shadow) prices to national income measured at identical scarcity prices; the ratio of exports or imports measured at comparable world market prices to national income measured at identical scarcity prices; the ratio of exports or imports measured at comparable world market prices to national income measured at the same comparable world market prices; and the ratio of exports or imports measured at internal domestic prices to national income measured at the same internal domestic prices.

Economists would generally prefer the first measure in all situations in which either domestic or international prices are known to be distorted. Unfortunately, domestic scarcity (shadow) prices for the Soviet economy are generally available to Western researchers and even their estimates in the Soviet Union obtained from solutions of large-scale linear programming models of the Soviet economy must be highly tentative.

The third measure is of considerable interest if one believes that the Soviet planners actually behave as if their domestic prices, which are known to be seriously distorted and in many cases quite arbitrary, were scarcity prices conveying correct information about opportunity costs within the Soviet economy. In short, if the Soviet leaders believe that 20 percent of their national income is accounted for by imports, then they may feel that the Soviet economy is quite vulnerable to Western trade sanctions and it really does not matter what the real dependence of the Soviet economy on imports is. The Soviet response to Western economic sanctions will then be governed by the perceived and not the actual vulnerability of the economy to these sanctions. In addition, our knowledge of the value of Soviet exports and imports in domestic prices contributes important implicit information about the relative price distortions of the actual domestic prices structure vis-a-vis the prevailing relative price structure on the world market.

The second measure, i.e., the ratio of exports or imports at comparable world market prices to national income measured at the same comparable world market prices, is inferior to the first, but greatly superior to the third measure. It utilizes world market prices which are scarcity prices indicative of the opportunity cost of different commodities on a worldwide scale. In an open economy, most of the domestic prices of traded good will move in the direction of world market prices. Actual equality of domestic and world market prices will not take place because of transport cost and various market imperfections. Nevertheless, economists generally have a strong preference for using world market prices in calculations of a country's trade dependence in all cases in which domestic prices are seriously distorted.

We shall perform a simplified calculation of the second measure and compare the results of this calculation with the results implied by the Kostinsky-Treml study. The following data are needed for the calculation: Soviet exports and imports in world market prices measured in dollars; and Soviet GNP measured in dollars and in world market prices.

Soviet trade with the developed West and with developing countries is conducted typically at world market prices and its dollar value can be obtained readily by converting official Soviet ruble trade statistics into dollars using the official dollar/ruble exchange rate. Soviet trade with CMEA countries and other socialist countries reported in official statistics has to be adjusted for the impact of preferential Soviet pricing of exports (e.g., low price for exported oil, gas, and various raw materials) and disadvantageous pricing of Soviet imports (e.g., high price for imported Cuban sugar and East European machinery and other manufactures). Thus official Soviet ruble trade statistics should be converted into dollars using derived dollar/foreign trade ruble exchange rates in which account is taken of differences in world market and intra-CMEA price level for particular commodity categories. Finally, in the absence of an estimate of Soviet GNP at world market prices, we propose to use a substitute—a U.S. Government estimate of Soviet dollar GNP arrived at by revaluing Soviet GNP components in dollars according to the relationship between the United States and the Soviet sectoral price levels. Although this estimate probably suffers from an "index number problem," at the present time it is the closest measure which we have suitable for our purpose.

The detailed calculation of the Soviet trade dependence is presented below in the appendix. Its main result is: Whereas the Kostinsky-Treml calculation shows imports to amount to 20 percent of Soviet ruble net material product or 15 percent of Soviet ruble GNP, our calculation based on world market dollar prices shows imports to represent a mere 4.1 percent of Soviet dollar GNP; in the case of exports, the Kostinksky-Treml calculation puts these at 7 percent of Soviet ruble net material product or 5.2 percent of Soviet ruble GNP, while our calculation based on world market dollar prices shows them to represent 6 percent of Soviet dollar GNP; and the major discrepancy between the Kostinsky-Treml results and our results of the calculation of Soviet import dependence can be attributed to the distorted relative price structure within the Soviet economy. In particular, the discrepancy in the two calculations can be explained by the relatively high Soviet internal domestic prices of manufactured goods vis-a-vis prices of energy and primary raw materials. Since the Soviets tend to import mostly manufactured goods and export mostly energy and primary raw materials, it is possible for Kostinsky and Treml to conclude that Soviet imports account for 20 percent of net material product and exports account for a mere 7 percent, implying a Soviet external trade deficit at domestic prices of 60 billion rubles, while at the same time the Soviet Union enjoys a significant surplus trade position at actual transactional prices (5.2 billion foreign trade rubles) and even greater surplus at comparable world market prices (an equivalent of $27.2 billion).

In conclusion, we feel that the correct interpretation of the Kostinsky-Treml study is that it shows how seriously distorted and irrational the domestic Soviet relative price structure is The study does not provide good information on the dependence of the Soviet economy on foreign trade. The interpretation that the results of the study tend to support the view that the Soviet economy is more vulnerable to Western economic sanctions than previously thought is, in our view, now warranted. If, however, the decisions of Soviet leaders are in fact completely based on biased assessment of their country's dependence on imports and they are likely to respond to Western economic sanctions on the basis of perceived and not the actual vulnerability to these sanctions, then the important contribution of the study is in showing us just how seriously misled the Soviet decisionmakers may be by their own statistics.

## APPENDIX—ALTERNATIVE VALUATIONS OF 1980 SOVIET FOREIGN TRADE

| Region | In actual transactional prices (million foreign trade rubles) | Dollar/foreign trade ruble exchange rate | In world market prices (millions) | In domestic prices (million domestic rubles) |
|---|---|---|---|---|
| Exports: | | | | |
| Eastern Europe | 20,919 | 1.8423 | $38,539 | n.a. |
| Other CPE's | 5,947 | 1.7373 | 10,332 | n.a. |
| Socialist countries | 26,866 | 1.8191 | 48,871 | n.a. |
| Developed West | 15,862 | 1.5406 | 24,437 | n.a. |
| Developing countries [1] | 6,907 | 1.5406 | 10,640 | n.a. |
| Nonsocialist countries | 22,769 | 1.5406 | 35,077 | n.a. |
| World | 49,635 | n.a. | 83,948 | 32,000 |
| Imports: | | | | |
| Eastern Europe | 19,095 | 1.0144 | 19,370 | n.a. |
| Other CPEs | 4,554 | 1.1561 | 5,265 | n.a. |
| Socialist countries | 23,649 | 1.0417 | 24,635 | n.a. |
| Developed West [2] | 15,733 | 1.5406 | 24,239 | n.a. |
| Developing countries [1] | 5,093 | 1.5406 | 7,845 | n.a. |
| Nonsocialist countries | 20,826 | 1.5406 | 32,084 | n.a. |
| World | 44,475 | n.a. | 56,719 | 92,000 |

[1] Including Laos.

[2] Including special imports of pipe and pipeline equipment.

Source: column (1) official statistics from 1980 Soviet Foreign Yearbook; column (2) offical Soviet dollar/ruble exchange for 1980 was 1.5406 dollars per $1; estimates of conversion rates for Soviet trade with Eastern Europe and other CPEs were made by Wharton; column (3) column (1) multiplied by column (2); and column (4) estimates by Kostinsky and Treml as reported in the press.

*Alternative measures of Soviet national income in 1980.*—Net material product (official Soviet figure) equals 458.5 billion domestic rubles; Gross national product (Wharton estimate) equals 611.3 billion domestic rubles—Assuming the GNP/NMP ratio for 1980 of 1.3333—Dollar gross national product (U.S. Government estimate) equals $1,392.5 billion.

The CHAIRMAN. Let us go to some questions now. I would like to put a basic question to both of you as to what you see for the future in trade relations with the Soviet Union and the Western World. Given the confluence of problems facing the Soviet economy in the 1980's, and the outlook for Western credit for economic reasons alone, what do you see as the trend line for the future in Soviet trade volume with industrialized democracies for the 1980's?

Mr. LEVINE. Without being very specific in terms of numbers, what we foresee in the work that is going on at Wharton is a continuation of the increase of Soviet trade with the West, but at a much lower pace, a much lower rate of growth than in the 1970's. We also expect, as I think most people who look at the area expect and have already seen, much more attention on the part of the Soviet Union to trade with Western Europe compared with trade with the United States.

If you look at the economic relationships between the United States and the Soviet Union since 1972, there has been a significant amount of discontinuity in U.S. policy toward these economic relations. Soviet leaders in all of their political dealings are very much concerned with and desire stability in relationships. The interest of the Soviets in trade with the United States is still there, but it has been eroded, I think, by the history of the past decade.

The CHAIRMAN. Professor Treml, what do you see as the outlook?

Mr. **Treml.** I have examined some of the long-term plans of the Soviet Union, and targets in certain areas, and it seems specifically in the chemical industry, machinery, and equipment, in heavy machinery and equipment, and in various control instruments which are used in production of computerized machine tools, that the Soviet Union will be dependent and is relying and expecting to be importing large shares of these machines from the West.

The **Chairman.** Being very practical about the kind of problems that we have to cope with in our relationship with the Soviet Union, would you give me the benefit of whatever consensus that might have been developed in either of your institutions where you are dealing so intensively with the Soviet economy, how you reacted to the grain embargo imposed by President Carter and the positions taken by President Reagan against the grain embargo and extension of the agreement for 1 year, and then the sanctions that have been imposed, and their effectiveness? What kind of reaction do you personally have? Or if you can give a consensus of some of your colleagues' opinions, that would even add to the answer.

Mr. **Levine.** I think you have put us into a difficult position, asking us to express a consensus. I think there is a consensus, but on the record I would much prefer to speak for myself on these matters. My views, first, on the grain embargo, may be quite different from the consensus. In looking at the problems of developing an effective economic leverage policy and program, I think it is much to be desired to be able to be in a position where through quiet diplomacy and through an indication that we might cut off benefits that are now flowing to the Soviet Union from economic relations with the United States, rather than being in a position of actually having to cut off these relations or some part of those relations. That is, in this business of economic leverage, a threat of sanctions is much better than the actual levying of sanctions. Obviously, however, the threat has to have some credibility, and therefore you do have to demonstrate a willingness to use an economic weapon if you are going to play that game at all.

I think that the grain embargo was one of those instances. If there were people who really thought that the grain embargo would get the Soviet Union out of Afghanistan, then they do not understand what the possibilities are from these coercive economic weapons. However, once having demonstrated that an American administration is willing or would be willing to bite the political bullet of handling the U.S. farm community, I think that the weapon of a grain embargo has now or could be made to have some effectiveness. We have shown a willingness to use it, which gives it credibility if the situation gets to a point where we would want to use it again.

The sanctions on the pipeline, I think, are the exact opposite. The sanctions were used in a situation where our ability to affect anything to hurt the Soviet Union was minimal at most. This was an arrangement that was well down the line in terms of the negotiations. The agreements were made, and the possibility of stopping it was almost nonexistent. But what the pipeline sanctions demonstrate, perhaps more than anything else, is the need in all of the exercise of economic leverage to have a coordinated policy with our Western allies and in general with other suppliers of any material if the material is going to be embargoed, if an embargo is going to be the tool that is going to be used for a program of economic leverage.

I think the general consensus is that the sanctions on the pipeline were misconceived.

The **Chairman**. Thank you.

Professor Treml?

Mr. **Treml**. I am basically in agreement with Professor Levine. I just have one or two more comments on the grain embargo. I think it was effective in certain areas of the Soviet economy, and the fact that they did manage, did succeed in obtaining grain elsewhere—I am referring, of course, to President Carter's embargo—is really not that important to me, and should not be continuously cited.

In the last 10 years or so, the United States has been contributing to more than 55 percent of all grain entering into the world trade. This is close to being a monopoly, and while in 1 specific year they could go to Argentina or Australia, clearly if the United States would want to deny grain to the Soviet Union, the United States could do so effectively.

The projected imports in the current year and in 1983 are about 45 million tons of grain. There is absolutely no way the Soviets would succeed in importing this unless the United States would agree to it. So, the weapon of the grain denial, I think, is very powerful in this respect.

The **Chairman**. Thank you.

I wonder if you could tell us what happened when the export of Iranian gas to the Soviets was cut. What happened to Soviet internal consumption and to petroleum and gas exports to Eastern Europe?

Mr. **Treml**. It is really not my area of expertise. I am aware of one thing, that there were several complaints, including a very vocal one by Chairman Brezhnev that a number of fertilizer factories had to be stopped because of the absence of the natural gas for its production. The pipeline was completed, of course. The flow of gas was interrupted, and I think that we do see even evidence in the production of fertilizer and other chemicals the effect of this.

I cannot comment on the exports to Eastern Europe.

The **Chairman**. I am just wondering if this is a fair analogy of what might happen if the Soviets are delayed in building a new Yamal pipeline, but still try to meet gas deliveries to Western Europe. Do you think they have the capacity to meet those minimum requirements and stay on schedule? They certainly are going to have the will to do it now. They have been dared. I think it is an unfortunate thing when we have the Soviet Union and Western Europe working together to defeat an objective end goal laid down by the United States.

What do you think are their chances of doing it? Can they deprive Eastern European countries of gas supplies in order to meet the scheduled deliveries to the West?

Mr. **Levine**. Mr. Chairman, I have in front of me a statement on this issue which was recently made before a congressional committee by Dr. Edward A. Hewett, who will be on the next panel. If he were not here, I would try to quickly give you some of the information from his statement, but since he is here, and he is the expert on the subject, I would prefer to defer to him.

The CHAIRMAN. Very well. Fine. We will put the question to him then.

I may have additional questions to submit to you for the record.

Senator Glenn.

Senator GLENN. Thank you, Mr. Chairman.

I guess first and basic would be, how accurate do you feel our estimates of the Soviet economy are? We obviously are dependent to a large degree on some of their own figures. Do we really have the confidence that we can make estimates from the figures that we have?

Mr. LEVINE. Senator Glenn, you are addressing the question to two people who have made a good part of their livelihood in working with those data.

Senator GLENN. I thought you might be a little prejudiced in that regard.

Mr. LEVINE. Perhaps so. I would say in general that there are all sorts of problems with Soviet data. But then again, there are all sorts of problems with all data. When you read economists' and statisticians' comments about our own data and how accurate are they in showing what they purport to show, you get a little queasy about all economic data. There are, however, more problems with Soviet than with Western data.

With regard to the basic question, are Soviet data falsified, the general view (and there is much evidence for it) is that when the Soviet leaders publish a number, they consider that number to be accurate. They do not keep two sets of books. The numbers fed up to them, however, are quite distorted. Yet, if Soviet leaders do not like a number, feel it is lower than they would like it to be, or feel it gives more information about their economy than they want to give, they do not publish it (rather than making up a number and publishing that).

So that the data that are published, though insufficient, we feel are accurate. But then, there are substantial problems, of several types, with the interpretation of those numbers. That is where we get into a great deal of difficulty, and that is where in this particular issue that we are looking at this morning, the work of Treml and Kostinsky has been so important.

The Soviets publish their foreign trade data in "foreign trade ruble" prices. All trade with the West, is in dollar prices, converted at official exchange rates, to these foreign trade rubles, rather than at domestic ruble prices. In almost all of the work that we want to do on the Soviet economy, we want those data in as accurate as possible domestic ruble prices to compare the various sectors and activities in the Soviet economy with each other. What Treml and Kostinsky have done, in a painstaking and meticulous way, is converted those foreign trade ruble prices, into domestic ruble prices, and we are all much in their debt for this.

Let me say for the work in which I am involved as a consultant to Wharton on its centrally planned economies project, we make use of different types of data: official Soviet data, U.S. Government data, primarily CIA recalculations of Soviet data, and Professor

Treml's data (which were used in the data set in my prepared statement).

Mr. TREML. If I may add just one or two more comments, I think that we have learned how to interpret, adjust, and correct Soviet data. In fact, I would be prepared to go as far as to say that in certain areas of economic statistics, Soviet economists rely on Western data. For instance, the now traditional monographs produced by the Joint Economic Committee on the Soviet economy are in great demand in the Soviet Union. Because of ideological reasons and secrecy reasons they simply do not explore or research certain areas, and they depend on and study ours.

Senator GLENN. I wish them the very best if they are relying on our data, because we cannot rely on it here on Capitol Hill. [General laughter.]

In your testimony, Dr. Levine, you commented about the 7 percent of total machinery that comes from the West, that we supply 7 percent of that, but in the overall scheme of things, it is only about 1 percent of the machinery that they would be using in the Soviet Union. That would appear to make anything we do absolutely minimal. Is that correct?

Mr. LEVINE. Senator Glenn, you are absolutely right in terms of those aggregate numbers. That is, if you apply the percentage numbers in the last column of the table in my prepared statement to the percentages in the third and fourth columns, which are the share of machinery imports from the West in total machinery supply in the Soviet Union and the shares in the part of that machinery that goes directly into Soviet investment, then the U.S. share comes out generally to less than 1 percent.

Senator GLENN. Would that include third parties, in other words, if we ship to Poland and Poland ships to the Soviet Union as a passthrough?

Mr. LEVINE. No, it does not include that.

Senator GLENN. Do we know what the total traffic would be, including our shipments to their satellite nations?

Mr. LEVINE. I don't have that here, and I would not hazard a guess.

Senator GLENN. That would be the total impact on the Soviet Union's ability to manufacture or do whatever it wants to.

Mr. LEVINE. Let me say, however, that there is a deceiving relationship in economic analysis of aggregate data. Anything that you look at individually always looks almost insignificant when compared with the big aggregates, like total industrial output or total GNP. The issue of leverage pertains, more often, to the significance of particular foreign economic relationships.

Senator GLENN. That is my next question. I do not think either one of you really addressed that in any detail in your statements. Do you have studies that the committee could have which show particularly sensitive points where the cutoff of a particular thing such as perhaps drill bits, or, say, chemical plants which enable them to do a lot that they could not do on their own, are there particularly sensitive areas like that on which you have made studies that just do not fall under some aggregate of percent of gross machinery, say?

Mr. **Treml**. If I may precede my answer to this question, Senator, with one comment concerning table 1 in Professor Levine's testimony, basically, we start working with Soviet data in external prices, and the share of the United States is based on the assumption that the conversion ratios or whatever are identical for the entire world. We do know that they are not. In fact, if you would look at the unavailable to us Soviet recalculation of table 1, say, in domestic rubles, the U.S. share considerably would be higher, simply because this is an average; assuming that all of Western machinery is the same.

My very rough studies indicate that at least in certain areas it would be higher. They do import heavy roadbuilding. They export simple, inexpensive bulldozers and roadbuilding machinery. They import heavy, sophisticated, large trenchbuilding, roadbuilding machinery, equipment from the United States, and these are converted at a much higher rate than would be implied by this one, but as I suggested earlier, we do not really have this date, because we have not studied it.

Senator **Glenn**. In trying to make policy decisions here, of course, it comes down to priorities in their different economic sectors. In my own mind, at least, I draw large differences between consumables, such as grain, for which they pay cash on the barrelhead, or in effect cash on the barrelhead, as opposed to things which would develop their own economic infrastructure, such as a chemical plant or drill bit technology, which would enable them to have more gas for export and things like that.

That is what I was trying to get at, the ones that would be particularly sensitive. I think what we are getting at there is what is a convenience for them as opposed to a necessity. In other words, it may be more convenient for them to buy from us than it is to develop a factory to do a certain thing if they have a full capability of doing it, as opposed to something that they just cannot do without our help. Those are the touch points, it seems to me, or the pressure points, the leverage in which we would be particularly interested, if there are any studies on that.

Mr. **Levine**. I would argue, Senator Glenn, that if you really seriously mean the word "necessity" that is probably an empty box. Everything is a degree of convenience, some more, some less. This leverage business is the measure of costs and benefits, and we do not have any stranglehold on the Soviet Union in any sector.

Senator **Glenn**. The things that they were using on international markets for trade and for their hard currency exchange were oil, gas, and gold. Now, they have taken their lumps in each one of those areas, because there is an oil glut, and the gold price has gone down, and they are trying to get the gas on-stream with the pipeline. Those were their main areas of doing things, of providing the wherewithal to do things with the rest of the world.

If there are ones that you foresee in the future, in developments in the future that are in the computer field that they do not have, for instance, or advanced chemical plants that they do not have the capability of producing, those would be the areas, it seems to me, that would be particularly good, if we had some studies in those particular areas.

Some figures that the CIA gave us back about a year and a half ago that I brought up in our meeting yesterday, as I happen to recall, they were sanitized figures that we asked them to put together that could be released, and at that time there was about a 12-million-barrel-a-day production capacity that they had about 1½ years ago. They were using about 9 million barrels domestically.

They were selling to their satellite countries about 2 million barrels a day at bargain prices, and they were then selling on the world market about 1 million barrels a day, and that was, in fact, their biggest single source of hard currency exchange at that time, which enabled them to do all of this other buying that we are talking about. So, that was one area on which they were particularly vulnerable at that time.

Now, that is one reason why the American drill bit technology which is so far superior to the Soviets' was a very important touch point. It was a choke point on their technology which they did not have the capability to develop for a number of years. If there are others like that, other areas that you would know of, I would appreciate it, either here or privately, however you would see fit to provide it. Please give it to us, because I would like to know about any areas like that. Those are areas that I see as having an impact on restrictions of trade.

If we cut off products that other nations are quite happy to provide and which is available in plentiful supply on the international markets, we may beat our chests and be very proud that we did in fact cut off trade with the Soviet Union and all of that, and we will all make great political speeches about it, but in the overall scheme of things, it will not be that effective.

So, if there are areas like that that you can give us, I will appreciate it.

I know that my time is up. Thank you, Mr. Chairman. But first, did you wish to reply to that at all? Do you know of any certain areas before we leave this?

Mr. **Treml**. I would mention, and this is in the past, that the machine tools producing miniature ball bearings, which we did sell them, now, in this particular area the United States has a total monopoly. No one else in the world is or was producing that. So they did come to it by the United States and solved a number of very technical problems by importing machinery producing miniature ball bearings.

Now, another area may not be very significant, but this is a major interest of mine in my research. The Soviet Union has a particular problem, a major problem with alcohol abuse, and they are desperately trying to substitute beer for strong liquor, and the United States also has a monopoly in the world on the export of hops. Two years ago, the price on the world market tripled, and the Soviet Union continued to import. Anywhere from 20 to 30 percent of total hops going into the production of Soviet beer is imported from the United States, and there is evidence that in fact there is more dependence because West Germany buys hops from the United States and turns around and sells it to the Soviet Union.

Senator **Glenn**. Well, we will really cut them off. We will cut off their beer, and that will really bring them to heel. [General laughter.]

The CHAIRMAN. Thank you, Senator Glenn.

Senator Boschwitz.

Senator BOSCHWITZ. I would like to pursue that just a little, Professor Treml. I have never heard that before. We have a monopoly on hops? Is that what you are saying? That the Soviets import hops from us for the purpose of making liquor?

Mr. TREML. In terms of hops entering world trade, I think the United States and West Germany contribute maybe as much as 80 percent of total hops traded in the world, and they are importing large quantities from the United States. Again, the Hop Growing Association of the United States believes that part of hops sold to West Germany is, in turn, exported to the Soviet Union. You know, it may not appear to be that important in terms of overall consumption, but in this respect we do occupy a monopoly position.

Senator BOSCHWITZ. You used that term, "monopoly position," a couple of times. Do they not produce their own hops?

Mr. TREML. You know, that is a mystery to me. I studied it. They made plans to triple their acreage. It is not particularly a difficult plant to grow, but they failed.

Senator BOSCHWITZ. They what?

Mr. TREML. They failed. They did not manage to increase it. So they still rely on imported hops.

Senator BOSCHWITZ. I am not very familiar with what hops are used for other than beer. Are they used for liquor other than beer?

Mr. TREML. No, I think it is only used for malt liquor, and that is beer.

Senator BOSCHWITZ. But beer is not their principal problem?

Mr. TREML. No, but it is a principal ingredient of making beer.

Senator BOSCHWITZ. You also used the term "monopoly" when you were talking about the grain trade, that we had 55 percent. Therefore you felt that the grain embargo has an impact?

Mr. TREML. Well, simply because if we would restrict trade, the prices on grain in the world markets would rise to the point where, say, the Soviet Union or Eastern Europe simply could not afford to import it. It really varies from 52 to 55 percent, but it has been over 50 percent for at least 10 years.

Senator BOSCHWITZ. Has that been the experience? There have been a number of embargoes imposed. Has it been the experience that the price rises?

Mr. TREML. Yes.

[Mr. Levine nods affirmatively.]

Senator BOSCHWITZ. Boy, you must be looking at different figures than I am if you think that the prices on the world markets have risen due to embargoes. As a matter of fact, they fell quite sharply after the last embargo was imposed. Is there evidence that the Russians have had trouble obtaining the grains that they needed?

Mr. TREML. I was referring in this specific instance to the prices paid by the Soviet Union for grain when they were forced to go elsewhere.

Senator BOSCHWITZ. There has been little evidence that I have seen that the prices they have had to pay are nominally higher. I have seen the figure that they have had to pay, an additional several hundred million dollars, but the cost to this economy was quite a bit more severe. As you may recall, we had to cover the contracts of the international traders the last time an embargo was imposed, with the result that we had to shell out several hundreds of millions of dollars because the price fell. The difference between the contract price that they had with the Soviets and the price that the market assumed after the imposition of the embargo was such that we, as a government, had to subsidize the world traders.

My experience is that the extra cost is either nominal or nonexistent. Did they have any trouble filling their needs?

Mr. TREML. Well, not in that year.

Senator BOSCHWITZ. Have they ever had any trouble filling their needs in any year other than through natural difficulties because of short crops?

Mr. TREML. I am not prepared to fully answer this question.

Senator BOSCHWITZ. But, professor, you stated earlier that we have a monopoly on world grain and that we had an impact on the Soviets, and now you are not prepared to answer whether or not they have been able to get as much as they need or whether it has had any impact on the Soviet economy?

Mr. TREML. Well, the livestock did decrease.

Senator BOSCHWITZ. Excuse me?

Mr. TREML. It did decrease in the Soviet Union, so clearly if they could have imported more, they would have imported more. One area that I am not fully prepared to discuss, to which I was referring, is the physical capacity to import and handle port capacities. I understand—I did not study it myself—that these are somewhat limited, so maybe this was one of the constraining factors. I was only referring to this particular issue.

Senator BOSCHWITZ. That has been the only constraining factor, perhaps with the exception of the availability of hard currency. I hope you will be here when Mr. Jenkins testifies, because I see in his testimony that he covers some of that, but quite clearly the Soviets have been able to obtain whatever they needed by way of grain imports. We do indeed dominate international trade. What percentage of world grains that are produced are shipped in international trade, professor?

Mr. TREML. Of total grain produced in the world? Total trade, I believe, is in the neighborhood of about 200 million tons, and this includes, of course, feed grains.

Senator BOSCHWITZ. I believe it is a little bit more than that.

Mr. TREML. I do not offhand have the total for the world production.

Senator BOSCHWITZ. Approximately 9 percent of the grains produced in the world are shipped in international trade, and quite clearly there are 140 countries in the production of grains. If production is increased by 1 or 2 percent worldwide, you will have a flood of grains in international trade.

I would suggest that you look at what happened in Argentina particularly after the embargo was imposed, and that you look at what their capabilities in production are, because those capabilities are quite large indeed, and to support the idea of an embargo will probably mean that we will have a permanent loss of those markets and probably permanently cause a change in the infrastructure and transportation facilities of some of these other countries that will have an horrendous impact on our farm trade and on our general balance of payments.

I hope you will review that prior to saying that we have made some impact on the Soviets through the imposition of those embargoes. If the impact had been as large as it was upon our rural economy, then I would agree with you, but it was not nearly as large. It caused them to scramble around a little before they were able to replace all the contracts, but indeed they did, and there has never been a year in recent years when they have not bought what they needed. The only constraint, as you say, is the ability of their ports and also their interior transportation.

I hope you will listen to Mr. Jenkins, who makes a statement with which I certainly agree.

Thank you, Mr. Chairman.

The CHAIRMAN. Thank you, Senator Boschwitz.

Senator Tsongas.

Senator TSONGAS. Mr. Chairman, I would like to state for the record that I would hope that the testimony that we got yesterday from the CIA would be made available. There was virtually nothing in there that I felt was of a confidential nature. It seems to me that the American people have a right to hear the same data that we heard yesterday.

Senator GLENN. Could I back you up on that? I would like to second that. I wonder if we couldn't ask them as a committee to see if we couldn't get a sanitized version of that whole transcript that could be released.

Senator BOSCHWITZ. There were some things in there, Senator, that were certainly the subject of some contention between the various departments of government. For instance, Professor Treml spoke about the capacity of the Russian ports and the Russian interior system, and there are some classified aspects to that.

Senator GLENN. I did say a sanitized version, by which I meant one in which they would take out anything that would still be classified, but one which would leave the general gist of what we heard yesterday open to the public. If it cannot be done without giving away classified material, then I would not propose releasing it, but that is what I meant when I said sanitized version.

The CHAIRMAN. You are talking about the material that was given in the testimony itself, and not in the question and answer period?

Senator GLENN. I would not object to the whole thing, if it could be done so that it would be unclassified, because I did not think there was that much that was hard core intelligence information. If some of it could be released, I thought it was a very good session yesterday afternoon, and I would like to see all of the American people have the same benefit as we did, if we could do it without giving away sources, and I ask that this not be charged to Senator Tsongas's 10 minutes.

The CHAIRMAN. I think it is an important request, and I will certainly join with you. I see no reason—I went through the report carefully afterward, because I could not attend the meeting, but a great deal of that material would be useful and helpful.

Senator GLENN. I think so, too.

The CHAIRMAN. I believe a sanitized version is a reasonable request, and I will certainly back you up in making that request.

Senator BOSCHWITZ. Mr. Chairman, I would hope that we, as a committee, would have an opportunity to discuss that. Otherwise, we are going to be getting sanitized versions from the CIA on other areas that we will not want. If they feel that after listening to them—well, maybe we will get too sanitized a version anyway.

I certainly feel that sometimes, that they are not direct enough with us, but if we ever expect them to be direct and straightforward, not only do we have to honor the privacy of those communications and not make up our minds what can and cannot be disclosed unless it appears in the public press anyway, but if we are ever going to have meaningful presentations by the CIA, I think we have to be careful about coming out afterward and saying that we should make them public.

The CHAIRMAN. Thank you, Senator Boschwitz.

Senator Tsongas, would you please begin now?

Senator TSONGAS. In my remaining time, let me say this. One of the reasons I was hoping to get this released was because if it was released, then it would be in the New York Times and in the Washington Post, and then the President might hear it. [General laughter.]

Since there was some question as to whether he indeed had the benefit of the same analysis that we got yesterday.

I would hope that the discussion about the hops would not be taken too seriously. If we have another incident and we suddenly cut off hops from the Soviet Union, I think our standing internationally will be beyond repair. [General laughter.]

A Budweiser approach to bring the Soviets to their knees. [General laughter.]

Senator BOSCHWITZ. Begging for hops on their knees. [General laughter.]

Senator TSONGAS. It is the kind of thing that Doonsbury could spend a month on. [General laughter.]

Many academics, as you know, have arrived in Washington and have become policy advisers. If you were in that position during the Carter administration and now, during the Reagan administration, and the President said to you as to the grain embargo and as to the pipeline decision, what is your advice, should we do it or not, and you only had one hand, what would your advice be?

Mr. LEVINE. My advice would have been to go ahead with the grain embargo under the conditions that existed then, and not to go ahead with the pipeline sanctions.

Mr. TREML. I just wanted to support what Professor Levine was saying. I think it is very important how we handle it diplomatically. If we embarrass the Soviet Government openly, or force them into open concessions, there will be much more reluctance to modify their policies. I think that the quiet diplomacy threat which is channeled through some sort of diplomatic channels would be much more effective. I would basically agree with Professor Levine, but my knowledge of the pipeline equipment is really secondhand, and based on Professor Hewett's study.

Mr. LEVINE. Let me also say, Senator Tsongas, that while I am not privy to the negotiations that went on before the invasion of

Afghanistan, my understanding is that we knew for quite a while the Soviets were mobilizing to move into Afghanistan. I think that was the time for very serious quiet diplomacy with a clear statement, a clear indication to the Soviets that we did have some ways of causing them some distress.

Senator **Tsongas**. In both those situations, we imposed a grain embargo, and we took it off. We have now gone through discussions on the pipeline embargo, et cetera. Who is better off after the fact, who is benefited from those two decisions, if you add in the entire universe of considerations, political, economic, et cetera?

Mr. **Levine**. Well, again, if I might start off, I think in many ways history has, in a sense, been kind to us in the grain embargo situation, in that the Soviets are going through an unprecedented period of bad weather and bad harvests. Although it may be correct that the Soviets were able to get their imports, it cost them very heavily. The indications are that they did pay a high price. They have strained their internal resources, internal transportation resources. Any visitor to the Soviet Union in the last few years witnesses food shortages, a food strain. Nobody is starving, but there are food strains that one did not see in the recent period before the last few years.

So, I would say that although there is great feeling in the United States that we lost a lot from the grain embargo, I think the Soviets were hurt by it. If anything, the Argentines gained a great deal. But that is one of the problems that you face with all use of economic sanctions.

I cannot see how we have benefited from the pipeline sanctions. And I think that the debacle for the Western alliance, aside from the economic aspects of it, is an extremely high cost to have paid for something that had very little probability of useful effect.

Senator **Tsongas**. Do you share that view?

Mr. **Treml**. I share the view. Yes. There are, in fact, very serious shortages of a number of food products in the last 2 years in the Soviet Union, not in major cities such as Moscow, but in the periphery, and that really has not happened in the last 20 years in the Soviet Union, including shortages in bread and bakery products. That to the Soviet population is quite symbolic and important. So, of course, it is a combination of embargoes and very poor harvests which followed in the last few years.

Senator **Tsongas**. Can you give me an example of a country that responded to economic pressure? I think you raise in your testimony, as did the CIA, the whole issue of the other psychological agenda. Namely, if you stick your finger in my chest, I am less likely to do something than if you did not. What would be an example of response to overt pressure?

Mr. **Levine**. Regarding response to overt pressure, I think all of the studies that I have seen indicate that not only do not great nations respond in the way a coercing nation wants to overt pressure, but even small nations do not respond. That is, overt pressure is just a very poor instrument if you measure the response to that pressure. What we rarely measure is the response to quiet diplomacy, to secret diplomacy. This omission causes great problems for research in this whole area. We do not know all the situations when there has been a payoff, because it is only the quiet ones that really have a high probability of payoff.

Senator TSONGAS. Let me tell you, if any secret diplomacy ever had a high payoff, you would know about it. [General laughter.]

Mr. LEVINE. Well, I would say that the Kissinger negotiations on the emigration of Jews from the Soviet Union is probably one of the major examples of some payoff, maybe not so much to economic pressure, but to the promises in détente of the carrot rather than the stick—the balance between carrots and sticks are part of this whole economic leverage policy. That was effective. And it lost its effectiveness after the overt act of pressure in the Jackson-Vanik amendment.

Senator TSONGAS. In terms of an embargo, I am trying to think of areas. It would be one thing if you talk about the United States and the Soviets, et cetera, but you have the Argentines in grain, and you have the Europeans and the Japanese. Remember the great to-do about the Kama River Truck Works, and how we provided them the capacity to build trucks, and they used those trucks in Afghanistan. If it wasn't for the Kama River Truck Works, they would not have invaded Afghanistan, et cetera.

I go out on American roads and I see Japanese trucks. The thought occurs to me, I wonder if the Soviets also realize that somebody else besides the United States makes trucks. Do you think that thought has crossed their minds at all?

Mr. LEVINE. I am sure it has, and with regard to the pipelaying equipment on the pipeline, the Japanese substitute is well known.

Senator TSONGAS. Mr. Chairman, I think the U.S. policy on the pipeline—well, let me say that I concur with Senator Boschwitz, by the way, on the grain embargo. I think when all things are said and done, infrastructure has been developed in other countries that are not in our economic interests, but the pipeline decision is really very counterproductive. Not only economically, in your State, and it does not really have any effect in mine, but I think the damage done to NATO is serious, and I think the Soviets are a lot better off now, more so than they were before we did it. In fact, I think the Soviets would probably want to keep the embargo in place, because they are now working with the Europeans, and the Europeans are angry at us, and the economic impact on them is minimal.

So, I think what the President did on the pipeline is probably exactly what the Soviets in retrospect would like to see happen.

The CHAIRMAN. I have expressed myself on this subject before. I feel we are not impressing the Soviet Union by kicking ourselves and our allies in the shins or by shooting ourselves in the foot. As I said in my opening statement, I think if we are to have sanctions, you have to have them be effective.

We all know that it would take total unity in the Western World to have an effective sanction. When President Carter tried to embargo grain, to have the Argentine market go from 10 percent exports to the Soviet Union to 81 percent exports to the Soviet Union, to have 5-year contracts signed by Canada and other countries, it was just totally ineffective. It certainly is not hurting the Soviet Union sufficiently to warrant the kind of harm it has done here, and the appearance of ineffectiveness, which is, I think, just as damaging.

The pipeline, though it does not affect my State very much, about 80 percent or 75 percent of the jobs that have been lost through the sanctions are lost in the State of Illinois, which is incredible, but it is companies like Fiat-Allis, Caterpillar, Deere and Co. and International Harvester, that have suffered terribly as a result of those sanctions, but most of that is not—very little of it for the pipeline, if any. It is mainly just old technology that they can buy readily and quickly from someone else, and do, and we are permanently giving those markets away, because we have the image of an unreliable supplier.

Senator **Tsongas**. I would just say, Mr. Chairman, given the damage done to the American economy, given the minimal effect of this on the Soviet economy, and given the damage done to United States-European relations, I think at a minimum Chairman Brezhnev should send a letter of appreciation to President Reagan, at a minimum.

The **Chairman**. Well, I sent a letter to the President a couple of months ago when he first threatened to try to stop the pipeline, that we would not have an East-West crisis, we would just have a West-West crisis. I anticipated that we would, and we do have.

For the first time, a foreign diplomat told me yesterday, one of the most distinguished in Europe who has served in this country, that it is now popular to be anti-American in Europe for the first time in his living experience.

Senator **Glenn**. Mr. Chairman, this is an unclassified graph that came out of our meeting yesterday. It shows the flow through the pipeline at 100 percent power with American equipment and 100 percent flow which would occur therefrom. That is what we would do with our turbines and our compressors that we are sending over, but the importance of this is, with only one-third of the power input which they can put into place very easily by the existing equipment they have, or that they could easily get, with one-third of the power input, they still can put two-thirds of the flow through that line.

In other words, your power, the gas flow ratio is not a straight line function at all, so we are crippling them only in a very minimal way. That is probably all they could bring on stream for the next many years in any case. So we are not doing anything, except we have crippled ourselves with our allies by doing this. Someone over there, before we make policy decisions, needs to marry up the technology with what is going to occur after the policy decision is made, because it is going to be minimal. It is very clear cut.

The **Chairman**. I think our second panel is ready to launch into that question. We want to thank both of you very much. As I have indicated, we will keep the record open for questions that may be submitted to you subsequently.

Mr. **Levine**. Mr. Chairman, may I make one comment on something Senator Tsongas brought up? In regard to the CIA data, may I say that the outside academic and research community has profited tremendously from the open publication of CIA analyses and CIA data, and I would strongly second, from the point of view of the academic community, Senator Tsongas' request that as much as possible the CIA analyses be available to us.

The CHAIRMAN. I think they have been invaluable, too. I have said many times that I could not function as a U.S. Senator without the agency's analyses. They are invaluable. Much of it can be made available. They have in the past made valuable studies available for the academic community and for the general public. Thank you both very much.

We would appreciate our second panel coming to the table now. This panel will address issues related to United States or Western leverage on Soviet policies through our own commercial policies.

We are pleased to welcome Dr. Charles Wolf, international economic policy program director and dean of the Graduate Institute at the Rand Corp. in Santa Monica, who has done work on the efficacy of trade sanctions, Edward A. Hewett, senior fellow at the Brookings Institution, who is an expert on the Soviet economy, and Mr. Kempton Jenkins, vice president, governmental affairs, of ARMCO Corp., and a participant in the United States-Soviet Trade Council.

Mr. Jenkins was president of the United States-U.S.S.R. Trade Council from 1980 to 1981, and Deputy Assistant Secretary of State for East-West Trade, 1978 to 1980, and has served as a Foreign Service officer at our Embassy in Moscow.

We are very pleased and honored to have you here, Secretary Jenkins. Would you start off?

## STATEMENT OF HON. KEMPTON B. JENKINS, VICE PRESIDENT, GOVERNMENTAL AFFAIRS, ARMCO, WASHINGTON, D.C.

Mr. JENKINS. Thank you, Mr. Chairman. I want to state that I strongly support your opening statement.

It is a special honor for me to be before you. I remember fondly the opportunity I had to work with you and your committee a decade ago on behalf of Secretary Kissinger and Secretary Rogers. Thus, it is with some sense of being in the family that I come here today to talk with you about this subject, a subject which dominated most of our consideration even 10 years ago.

You have asked us to address the question of Soviet responses to Western economic pressures in the past and their likely responses to such future pressures. I would like to underscore here a point that you made in your opening statement and which Senator Glenn, Senator Tsongas, and Senator Boschwitz all touched on, and that is the importance of the effectiveness of our decisions.

Let me say at the outset that in my judgment the United States has, unfortunately, often pursued ineffective, shortsighted trade policies toward the Soviet Union based on a very serious misreading of our adversaries.

In the brief time that I have available, I would like to touch on five points. I will discuss the Soviet economic personality, what is unique about it and what it offers us in terms of possible points of influence, how we should proceed intelligently to measure the effectiveness of an economic initiative against the Soviet Union, and how to look at the cost benefit balance, which I would suggest has been the great missing ingredient in this and the last administration's approach to this question.

Finally, what actually happens within the Soviet system once such an action is launched; and briefly, what our overall goal is in facing Moscow today. Since I have been in the private sector, I have learned a few things about decisionmaking which are somewhat different than the way we approached them in the Government. One is to constantly go back and measure your day-to-day decisions against your long-term strategic planning.

There is very little discussion today in our debate which rages over trade with the Soviet Union about what we are really trying to accomplish with the Soviet Union.

In conclusion, I would like to make three very brief recommendations in closing which the committee may wish to consider as it grapples with this problem.

The Soviet economic personality is unique in many ways. Its profile determines its capacity and its instinct in responding to external economic pressures. The structure is ponderous, cumbersome, and slow to deal with new economic challenges. It is clearly more vulnerable to sudden change than the more resilient, flexible free economies of the world. Central direction by definition limits the capacity of an economy to adjust at the lower end of the economic process. It locks in inefficiencies.

However, there is another element to the Soviet economic personality that is even more critical in looking at this question, and that is the supremacy of political over economic direction. A vivid illustration of this is found in Stalin's decision to collectivize agriculture. The cost was massive in terms of economic performance, not to mention the roughly 15 million Soviet citizens who died in the process. The miserable performance of Soviet agriculture 50 years later underlines the political supremacy in that decision, but Stalin's aim was to break the resistance of the peasant first, and only secondarily was he concerned about agricultural production.

More recently, we had an unusually attractive economic opportunity for Soviet planners in the détente period, when we offered economic cooperation at an unprecedented level. It was abandoned in the face of our own ill-conceived effort to force political change in Soviet emigration policies. Professor Levine touched on this, but as you recall, sir, we were very much involved in this very question in this room before this very committee, and it was a very painful experience indeed.

The net result of this was the collapse of our negotiations with the Soviets in the trade field, and as a sidebar, a reversal of a tender but promising liberalization of the Soviet Union's restrictive emigration practices.

Faced with inevitable economic retaliation from the West, 3 years ago, Soviet forces did not hesitate to move brutally to suppress Afghan rebels who threatened an important Soviet political beachhead. These examples, chosen at random, illustrate the fact that in the final analysis, it is shortsighted to think that we can impact on Soviet national security or political objectives by the use in isolation of the trade lever.

The Soviet economy today is in a shambles, but the Soviet economy has always been in a shambles. The infamous 5-year plans have never been met or fulfilled. Shortages are a way of life. Sometimes they are worse than others, but they are always present.

And, in fact, specialists on the Soviet economy agree with those of us who have served in the Soviet Union that without the leavening effect of economic corruption, which in Russian is known as a "blat," and the looseness and laxness in implementation of the program, the system would eventually grind to a standstill.

There are many crisis areas in the Soviet economy today. Any one would be enough to lead a Soviet Murray Weidenbaum to resign if that option were available in the Soviet system.

Let me choose four to talk about this morning. First, the demographic impact of World War II has brought home the surplus labor problem and turned it into a crisis. There is a severe labor shortage today, not only in numbers, but more importantly in the mix which makes up that labor force. The technically qualified labor as opposed to the overall common labor pool is extremely strained. The geographic immobility of labor, a problem in any society, is immense in the Soviet Union, not only reflecting the geographic dimension of the Soviet Union, but also the historic ethnic differences in its population.

The Soviet Union is not a melting pot. It truly does consist of several nations distinct in culture, religion, and language. It is virtually impossible to shift any significant number of Uzbek laborers to the Ukraine or Ukrainians to Kazakhstan. Russian foremen are hampered in their ability to lead and direct the work of Tadjik tribesmen who have been transplanted into a Soviet factory from their 16th-century pastoral existence.

The labor shortage in the Soviet Union will not go away. The only significant pool of trained labor available to the Soviet Union today is in the Soviet Armed Forces. The reduction in the size of the standing Soviet armies could provide brief relief, and in the absence of such a political decision, no relief is in sight. Even technology is not an adequate substitute for the labor shortage in the Soviet system. It can and does help, but only marginally. This is particularly true because of the limited Soviet capability to introduce technological change quickly.

In the real economic world, it is also important to look at productivity when you look at labor problems. This is the second crisis area in the Soviet economy today. For more than half a century, Soviet leaders have attempted to substitute political slogans and ideological fervor for material rewards. In the absence of incentives, inhibited and discouraged by the oppressive weight of Marxist-Leninist ideology, Soviet productivity remains among the lowest of any of the developed economies. It is difficult to see how Soviet economic managers can overcome this fundamental problem short of abandoning the ideological underpinning of the present regime.

In the Eastern European countries, such as Hungary, where tentative steps have been taken in this direction, the economic results have been predictable: enhanced growth and increased productivity. But we see no signs in the Soviet Union, despite some flirtations in the 1970's under Khrushchev, of this kind of change.

The third fundamental crisis point in the Soviet economy remains agriculture. Much has been written and much testimony delivered to this committee over the years on this subject. It is important, however, when we attempt to evaluate Soviet responses to past and future external economic pressure that we take into account the failed Soviet agricultural experiment and its costs to their overall economic performance.

Suffice it to say that today per capita agricultural production in the Soviet Union still remains below the level achieved shortly prior to World War I! Massive amounts of foreign currency are consumed every year to import the basic agricultural needs of the Soviet population. Political careers are broken as promising young Soviet managers attempt to reform Soviet agricultural production. It is true that climate and rainfall conditions in the Soviet Union are difficult, but it is more relevant that failure to develop incentives, a personal work ethic based on rewards, and a transportation infrastructure dedicated to the consumer have made Soviet agricultural performance inevitable.

The fourth basic crisis in the Soviet economy is a critical lack of hard currency. This is mirrored in thousands of ways throughout Soviet society. The incredible determination of Intourist to charge New York prices for their most backward facilities, the unbending Soviet negotiating posture in business deals when they discuss the expenditure of foreign currency, the frantic efforts of Soviet economic planners to develop any products which can be sold in hard currency markets, the awkward CEMA structure by which the Soviet Union attempts to meld Eastern European economies into its own, and their refusal to join the International Monetary Fund and the World Bank are all manifestations of this basic problem.

Recognition of the key role of foreign currency goes back to the very beginning of Soviet power in Russia. Soviet training missions have consistently placed the development of hard currency at the top of their priority lists. An old colleague of mine in Government, Gen. Alexander Barmine, one of the Soviet Union's early trade representatives abroad, discussed at length with me a decade ago how even in the 1930's the pursuit of foreign currency dominated Soviet trade activities. He was constantly directed to ignore pricing as long as he could sell for Western currencies.

This is very relevant to the question we discuss today about who becomes dependent upon whom if that gas pipeline is built, since all of the estimates that I have seen emphasize that the Soviet Union would within the decade be some 65 to 70 percent dependent upon the hard currency earnings of that gas pipeline.

Shouldn't these weaknesses, these economic flaws lead to enhanced responsiveness by the Soviet Union to external pressures? In a society where economic needs have the priority of a free society, the answer would probably be yes, but it is essential to recognize that in the Soviet Union, political control has been, is, and likely will continue to be the controlling factor. Therefore, the answer has to be, maybe, sometimes.

In my judgment, any consideration of reaching for the economic instrument to influence Soviet policy must first determine what do we intend to achieve; second, assess whether economic pressure can be effective; and above all, take account of alternative availability and understand the relative value of political, national security, and economic objectives both to the Soviet Union, our allies, and ourselves.

Third, we must insure that all preliminary steps have been taken to guarantee the effectiveness of any economic initiatives, including full consultation with our allies. Fourth, it is essential to weigh the cost to the United States and insure that the achievement will outweigh the cost.

Professors Levine and Treml discussed the costs to the Soviet Union both of the grain embargo and the pipeline. That is important and relevant, but it is to operate in a vacuum if you ignore costs which result to our side of the equation. We rarely have fulfilled the requirement of doing a complete cost-benefit analysis before adopting "the economic option" during a crisis. The incredible example of President Carter's response to Afghanistan will stand in history, in my judgment, as how not to proceed.

The sudden, ill-considered, arbitrary disruption of the delicate international grain market mechanism and our dominant position in that market triggered a series of interrelated changes from which our agricultural sector has still not recovered.

There are many prominent members of the agricultural sector who insist that the sudden reversal of the fortunes of International Harvester, John Deere, and Allis Chalmers and other agricultural implement producers, savings and loan institutions in the agricultural belt, and hundreds of other agribusinesses have to be attributed to the sudden catalytic effect of the Carter grain embargo on the Soviet Union. The net result of that initiative was to transfer a key traditional marketplace to new competitors. Not only did we lose the business to Argentina and other grain producers, we provided the economic incentives for the Argentines to develop the capacity to export grain on a long-term basis and compete effectively with the U.S. farmer indefinitely throughout the world.

Today, Argentina's grain sales to the Soviet Union equal ours, whereas in 1979 we supplied over 90 percent of Soviet imports. A side effect which as an old political officer I have to take account of in my mind has been a dramatic enhancement of Moscow's influence in the traumatized nation of Argentina today.

The grain embargo was hardly supported by the addition of other economic pinpricks. I must say, the announcement by the Carter administration of the grain embargo and the reduction of Aeroflot flights from New York from three to two a week was so ludicrous that it undermined our credibility right at that point.

Mr. Chairman, I participated in a series of meetings at the White House at the time President Carter was announcing these policy changes, first as a member of the administration on the 1st of January, and subsequently on the 4th as a member of the private sector. I heard Brzezinski, Secretary Vance, and the President address approximately 100 prominent businessmen at each one of these briefings. I was appalled, frankly, by the unresponsiveness of the administration spokesmen, including the President, to the alarm and concerns expressed by the business community about these policies. It was capsulized by Secretary Vance's reply. Having emphasized that the President had before him political, military, and economic options, Vance stated he had chosen political—a U.N. protest, the Olympic games embargo—and the economic, the grain embargo, Aeroflot flights, fishing rights.

Questioned time and time again as to why the President had chosen those levers and not the military lever—which does not mean the landing of American troops in Afghanistan, but it could have meant an earlier start on the essential rebuilding of our own military capability. Secretary Vance replied, because the President chose the economic lever. It is that kind of nonsequiterial policymaking which has put us into the hole where we find ourselves today, Mr. Chairman.

Let us briefly take a look at the workings of the Soviet economy when faced with external economic pressures. What happens when an embargo, unilateral, or even theoretically—if we could construct one—multilateral, is put into place. Interruption and complications very quickly swamp the relatively rigid 5-year plan process. Carefully husbanded short supply hard currency allocations are upset, and Soviet central planners are required to go back to the drawingboard. GOSPLAN, the central Soviet economic planning agency, is forced to revamp the intricately interdependent project plan. Allocations of labor, capital, transportation, and deliveries all have to be readjusted. Each of the dozens of functional ministries must in turn revise its plans. Foreign trade organizations or their import companies have to revamp their plans, and scurry around to fill the newly created gaps in their procurement projections.

The effect is not unlike a major train wreck on the Amtrak system. The entire system is immediately affected, if no easily available alternative sources exist. The only problem with this impressive scenario is, almost invariably, there is an alternative source available.

There are other long-range impacts within the Soviet Union, the continuing philosophical struggle between the champions of autarchy, those who foster traditional Russian hostility to foreign influences, Stalinists who favor control for control's sake are reinforced. The modernists, the pragmatic managers in the economic system, who seek to make things work, to produce, to deliver, are set back. Careers are affected. Political loyalists, the cautious ones, advance while those who favored greater integration with the rest of the world's economy suffer.

Recall historically the impact of Mao's cultural revolution or Stalin's destruction of the results of Lenin's new economic program and what it did to the cadres of the professionals and experts in both of those societies. We see in China today under Deng Xiaopeng, just now beginning to reemerge and take control of their economy and their policymaking, the sophisticates, the people who understand the whole world, not just China the Inner Kingdom.

It is worth reflecting on the decision by the Carter administration, now reinforced by the Reagan administration, to move against Soviet energy development as a likely point for economic pressure. CIA assessments of Soviet energy development have been much debated. The debate has come down to a matter of a few years one way or another, not a question of whether the Soviet Union is encountering a leveling off and an inevitable diminution of their capacity to produce petroleum. Virtually unlimited natural gas supplies can compensate for some of this, but gas and oil are not totally interchangeable. What can we expect if we were to significantly reduce Soviet energy production? A more compliant Soviet policy toward Poland, or a more aggressive effort for control over adjacent energy resources? To discourage, inhibit, threaten the development of Soviet petroleum must at best lead to their entrance into the commercial marketplace for Middle East oil, and at worst, and not unlikely by any means in my judgment, to more irrational, dangerous Soviet efforts to expand their influence and control over international petroleum sources.

It is interesting, Mr. Chairman, to look at the war between Iran and Iraq and the Soviet posture in that very delicate situation today.

Linkage is not the point of our discussion today. All respected specialists in Soviet affairs agree that linkage is a fact of life.

Secretary Kissinger in his latest volume wrote:

> We did not believe that trade itself could moderate Soviet conduct. Our basic reliance was on resisting Soviet adventures and maintaining the global balance of power. Economic incentives could not substitute for equilibrium. We believed, however, that Soviet restraint would be more solidly based if reinforced by positive inducements, including East-West trade.

I would like to point out, Mr. Chairman, that Soviet leaders themselves have never minimized the linkage between political and economic goals, internationally or domestically.

It is difficult to review this question today. The atmosphere is so highly charged and so politicized, and has found us in confrontation with administrations twice, but it still is important that we go back intellectually and look at the basics, as I mentioned earlier. Do we seek to destroy the Soviet system, to bring the Soviet Union to its knees, or do we pursue a policy of the carrot and stick designed to moderate Soviet behavior gradually but steadily. Under the Carter administration, tragically, we practiced the worst of all options, a policy of a diminishing stick and a limp carrot. Now we are reviving the stick, and I reiterate that this is essential in dealing with Moscow, but we seem to have abandoned the carrot altogether.

For the 2 years I was stationed in our Embassy in Moscow——

The CHAIRMAN. Mr. Jenkins, I just want to remind you that the witnesses were asked to try to summarize and keep their testimony to 10 minutes each. I think we have been about double that now. I do not want you to skip the recommendations. Maybe you would like to skip ahead to those.

Mr. JENKINS. Yes, sir. Let me just conclude then by saying that in my judgment trade is an important instrument, but it is a long-range fundamental weapon of significant potential only if used prudently and understood.

I do have a few recommendations in closing, three. The first has to do with consultation. I spent many hours with this committee and its superb, dedicated staff in pursuing the elusive goal of consultation between the executive branch and Congress, and it was good training. Consultation means sharing the development of policy, creating a strong vested interest in its success. As you and your distinguished predecessor, Senator Sparkman, have told me, sometimes rather sharply, sir, you want to be in on the takeoff, not just notified when the aircraft is about to crash.

As we look back on our economic initiatives directed at the Soviet Union, beginning in Afghanistan and subsequently in response to the repressive measures of the Polish military regime, we find very little consultation. Instead, there is a U.S. policy of go it alone. Let's teach them. Be a leader. This has predictively produced disarray, and weakened the substance of our Western alliance.

Second, I have touched earlier on the criticality of hard currency in the Soviet economic system. Moscow's hard currency shortage does constitute economic vulnerability. Foreign equipment, while small in volume—and there was an interesting discussion of this by Professors Levine and Treml, I thought—does provide a critical extra element which often saves inefficient Soviet economic projects from failure. It is essential in considering Western credit financing policies to work at it until we succeed in developing an allied consensus.

A common Western credit policy designed to cut back and eventually abolish subsidized financing would force the Soviet Union to pay the true economic price of trade. In fact, a good argument can be made and has been attempted by past administrations to apply that principle to all trade with all nations. Certainly, if we are seeking sensitive points in the Soviet economic system, this is one where action, if taken in unity, can produce results.

Finally, Mr. Chairman, I strongly recommend that we eschew once and for all actions which amount to no more than a Sunni rain dance, an event which has no effect on the weather, but brings a certain sense of comfort to the members of the tribe. Empty gestures, unilateral actions which ignore the economic and political realities of the Soviet Union, are not the way to influence Soviet policy. In fact, they undercut our credibility with Soviet policymakers and with our allies, and they contribute to the dangerous possibility of Soviet miscalculation as to our will power and determination.

Thank you, Mr. Chairman.

[Mr. Jenkins' prepared statement follows:]

### PREPARED STATEMENT OF HON. KEMPTON B. JENKINS

It is an honor for me to appear before you, Mr. Chairman. I remember fondly the opportunity I had to work with your Committee a decade ago on behalf of Secretary Kissinger and Secretary Rogers, and it is with some sense of being in the family that I accept your invitation to return today to discuss a critical problem of United States-Soviet relations—a subject which dominated most of our considerations even then.

You have asked us to address the question of Soviet responses to Western economic pressures in the past and their likely responses to such pressures in the future. Central to this discussion is an evaluation of the effectiveness of U.S. policy decisions. Let me say at the outset that, in my judgment, the United States has unfortunately often pursued ineffective, short-sighted trade policies toward the Soviet Union, based on a serious misreading of our adversaries.

That tendency is accentuated today and, with the present so-called foreign policy controls directed against Soviet energy development, has reached a particularly counter-productive level. It discourages me, Mr. Chairman, because as this Administration came to office intent on rebuilding America's military capabilities, it also announced that it would pursue a pragmatic, tough, predictable trade policy toward the Soviet Union. Specifically, senior officials of this Administration publicly emphasized their distaste for foreign policy controls, as opposed to national security controls, due to their ineffectiveness and their cost to the United States.

This morning, Mr. Chairman, in the brief time available I would like to cover five points:

First, I would like to discuss the Soviet economic personality. What is unique about the Soviet economic process and what it offers us in terms of points of influence.

Second, how should we proceed most intelligently to measure the effectiveness of an economic initiative or policy directed against the Soviet Union; how best to achieve a cost benefit analysis.

Third, once launched, how does the Soviet Union and its economy react to a U.S. initiative. What actually happens within the system.

Fourth, what is our overall goal in facing Moscow today and how can we pursue it most effectively.

Fifth, three short recommendations which you might wish to keep in mind as you consider our relationship with Moscow in this critical time.

## THE SOVIET ECONOMIC PERSONALITY

Any assessment or consideration of Soviet performance past and future must consider the personality of the Soviet economy. There are many ways in which Moscow's rather unique economic profile determines its capacity and instinct in responding to external economic pressures.

The Soviet economic management structure is ponderous, cumbersome, and slow to deal with new economic challenges. In the long run it is clearly more vulnerable to sudden change than more resilient, flexible free economies. Central direction by definition limits the capacity of an economy to adjust at the lower end of the economic process. It locks in inefficiencies.

However, there is an even more important characteristic of the Soviet economic system which affects their reactive capacity. That is the supremacy of political over economic direction. In historic terms the most vivid illustration of this factor was Stalin's decision to collectivize agriculture. The cost was massive in terms of economic performance, not to mention human lives; and the miserable performance of Soviet agriculture 50 years later underlines this fact. But Stalin's political aim, to break the resistance of the peasant, was achieved.

More recently a highly attractive economic opportunity for a major advance in cooperation with the United States was abandoned in the face of our ill-conceived effort to force a political change in Soviet emigration policies. Pushed to the point of public political embarrassment to Moscow, these efforts led to the collapse of United States-Soviet negotiations in the trade field and reversed a tender, but promising liberalization of the Soviet Union's barbaric emigration practices. Again, 3 years ago, faced with inevitable economic retaliation from the West, Soviet forces moved brutally to suppress Afghan rebels who threatened an important Soviet political beachhead. These random examples recall the consistent Soviet track record when political objectives are threatened: Economic requirements are sacrificed.

The Soviet economy today is in a shambles. But the Soviet economy has always been in a shambles. The infamous 5-year plans have never been met or fulfilled, shortages are a way of life. In fact, specialists in the Soviet economy agree that without the leavening effect of economic corruption (known as blat) in the Soviet Union, the system would grind to a standstill.

There are four crisis areas in the Soviet economy today. Any one of these should be enough to lead a Soviet Murray Weidenbaum to resign, if that option were available in the Soviet system:

First, the demographic impact of World War II has come home to roost and surplus labor, long the key fuel in Soviet economic growth, has disappeared. Instead there is a severe labor shortage, not only in numbers, but perhaps more importantly, in the mix which makes up that labor force. The overall shortage is extreme in terms of technically qualified labor. The geographic immobility of labor (a problem in any society) is immense in the Soviet Union. It reflects the geographic immensity of the U.S.S.R. and the historic ethnic differences in its population. The Soviet Union is not a melting pot and truly does consist of several nations, distinct in culture, religion, and language.

It is virtually impossible to shift any significant number of Uzbek laborers to the Ukraine, or Ukrainians to Kazakhistan. Russian foremen are hampered in their ability to lead and direct the work of Tadjik tribesmen transplanted into a Soviet factory from their 16th century pastoral existence. The labor shortage in the Soviet Union will not go away. The only significant pool of trained labor available to the Soviet Union today is in the Soviet armed forces. A reduction in the size of their standing armies could provide brief relief. In the absence of the political decision necessary to accomplish this, no relief is in sight.

Technology is not a substitute for labor in the Soviet system. It could help, but only marginally. This is particularly true because of the limited Soviet capability to introduce technological change quickly.

In the real economic world, it is essential to look at productivity when considering labor problems. This is the second crisis point in the Soviet economy. For more than half a century Soviet leaders have attempted to substitute political slogans and ideological fervor for material rewards for labor. In the absence of incentives, inhibited and discouraged by the oppressive weight of Marxist-Leninist ideology, Soviet productivity remains among the lowest of any of the developed economies. It's difficult to see how Soviet economic managers can overcome this fundamental flaw, short of abandoning all together the ideological underpinning of the present regime. In Eastern European countries such as Hungary where tentative steps have been taken in this direction, the economic results have been predictable: Enhanced growth and increased productivity.

The third fundamental crisis point in the Soviet economy remains agriculture. Much has been written, and much testimony delivered to this Committee on this subject. It is important, however, when we attempt to evaluate Soviet responses to past and future external economic pressure, that we take into account the failed Soviet agricultural experiment and its cost to their overall economic performance. Suffice it to say that today per capital agricultural production in the Soviet Union still remains below the level achieved shortly prior to World War I! Massive amounts of foreign currency are consumed every year to import the basic agricultural needs of the Soviet population. Political careers are broken as promising young Soviet managers attempt to reform Soviet agricultural production. It is true that climate and rainfall conditions in the U.S.S.R. are difficult, but it's more accurate that the failure to develop incentives, a personal work ethic based on rewards, and a transportation infrastructure dedicated to the consumer have made Soviet agricultural performance inevitable.

The fourth basic crisis in the Soviet system is a critical lack of hard currency. This is mirrored in thousands of ways in the Soviet society. The incredible determination of Intourist to charge New York prices for the most backward facilities, the unbending Soviet negotiating posture in business deals when they discuss the expenditure of foreign currency, the frantic efforts of Soviet economic planners to develop any products which can be sold in hard currency markets, the awkward CEMA structure and refusal to join the IMF and World Bank are all manifestations of this basic problem. Recognition of the key role of foreign currency goes back to the very beginning of Soviet power in Russia. Soviet trading missions have consistently placed the development of hard currency at the top of their priority lists. An old colleague of mine in government, General Alexander Barmine, who was one of the Soviet Union's early trade representatives abroad discussed at length with me a decade ago how even in the 1930's the pursuit of foreign currency dominated Soviet trade activities. He was constantly directed to ignore pricing as long as he could sell for Western currencies.

Shouldn't these weaknesses, these economic needs lead to enhanced responsiveness by the Soviet Union to external pressures? In a society where economic needs have the priority of a free society, the answer would probably be yes. But it's essential to recognize that in the Soviet Union, political control has been, is and likely will continue to be the controlling factor. Therefore, the answer is maybe, sometimes.

## THE COST/BENEFIT PROCESS FOR US

Any consideration of utilizing the economic instrument to influence Soviet policy must:

1. Determine what we intend to achieve.
2. Assess whether economic pressure can be effective. We must understand the nature of our adversary and target actions to what they consider critical. Above all one must take account of alternative availability and understand the relative value of political, national security, and economic objectives.
3. Insure that all preliminary steps have been taken to insure the effectiveness of any economic initiative.

This would include negotiations with our allies regarding alternative sources and the selection of companion non-economic steps to develop consistent significant pressure.

4. Weigh the costs to the United States and insure that achievement will outweigh the cost.

The incredible example of President Carter's grain embargo will stand in history of how not to proceed. The sudden ill-considered arbitrary disruption of the delicate international grain market mechanism and our position in that market triggered a series of interrelated changes from which our agricultural sector has still not recovered. There are many who attribute the sudden reversal of the fortunes of International Harvester, John Deere, Allis Chalmers and other agricultural implement producers, savings and loans in the agricultural belt, and hundreds of other agrobusinesses to the sudden catalytic effect of the Carter grain embargo on the Soviet Union. The net result of that initiative, was to transfer much of our traditional marketplace to new competitors. Not only did we lose the business to Argentina and other grain producers, we in fact provided the economic incentives for the Argentines to develop the capacity to export grain on a long term basis and compete effectively with the U.S. farmer indefinitely. Today Argentina's grain sales to Moscow are equal to ours whereas in 1979 we were the major supplier. A side effect has been a dramatic enhancement of Moscow's influence in that traumatized nation.

It is worth noting that the process by which that decision was reached was less than scientific. After a heated debate in the National Security Council, the final decision to apply the embargo to the Soviet Union was taken when the Secretary of Agriculture was out of town. His deputy was not allowed to attend on the grounds that the meeting was for "principals only"; a device all too often relied upon to shut out dissenting opinions; hardly characteristic of a strong self-assured administration.

In addition to weighing the domestic economic costs to the United States, it is essential to weigh the ramifications to our international interests. Any review of the effect of recent ill-starred efforts to apply economic pressures on the Soviet Union must take into account the effect it has on the cohesion of our own alliance. Mr. Chairman, it distresses me that one of the historic foreign policy objectives of the Soviet Union, i.e., to erode and splinter the Western alliance has been advanced by our own arbitrary action. The effect of our economic initiatives on other Western economies, the impact on the political stability of allied governments, and the costs in terms of our own economic interdependence on our allies are all essential elements in determining the validity of our policy. We find ourselves today in the most confrontational economic posture with Europe since World War II. Disagreements, some inevitable, and some results of a worldwide recession, are compounded by our insistence on proceeding with unilateral policies which we now try to impose on our European allies by a questionable legal extraterritorial lunge. Today we are negotiating on a continuing basis to resolve the life and death problems of Western steel industries. U.S. agricultural sales in Europe, already inhibited by European protectionism, are now threatened by retaliation because of our own efforts to use economic pressure on the Soviet Union. Expenditures by NATO allies for military investment, so critical to rebuilding the relative military strength of the West after years of neglect, are also threatened by the deterioration of our economic cooperation. In short, we are close to blowing the economic circuits with our closest allies, not because of the endemic economic problems we face, but because of the arbitrary unilateral introduction of a political effort to use economic pressures on our adversary.

## THE SOVIET SYSTEM REACTS

Let's look at the workings of the Soviet economy when faced with external economic pressures. What happens when a unilateral, U.S. embargo is applied. Interruption and complications swamp the relatively rigid 5-year plan process. Carefully husbanded short supply hard currency allocations are upset and Soviet central planners are required to go back to the drawing board. GOSPLAN, the central Soviet economic planning agency, is forced to revamp the intricately interdependent project plan. Allocations of labor, capital, transportation and deliveries all have to be readjusted. Each of the dozens of functional ministries must in turn revise its plans. The Foreign Trade Organizations or "import companies" must revamp their plans and scurry to fill the newly created gaps.

The effect is not unlike a major train wreck on the Amtrak system. The entire system is immediately affected, if no easily available alternative sources exist. The only problem with this impressive scenario is that almost invariably there is an alternative source.

There are other long-range impacts. The continuing philosophical struggle between the champions of autarky, those who foster traditional Russian hostility to foreign influences and Stalinists who favor control for control's sake, are reinforced. The modernists, the pragmatic managers in the economic system who seek to make things work, to produce, to deliver, are set back. Careers are affected. Political loyalists, the cautious ones, advance while those who favor greater integration with the rest of the world's economy suffer. Recall the impact of Mao's cultural revolution or Stalin's destruction of the results of Lenin's New Economic Program. At a time of political transition in the U.S.S.R. unilateral economic embargo actions will certainly not enhance the fate of those who promote moderation and economic cooperation.

It is worth reflecting on the decision by the Carter Administration, now reinforced by the Reagan Administration, to move against Soviet energy development as a likely point for political economic pressure. CIA assessments of Soviet energy development have been much debated. The debate has come down to a matter of a few years one way or another, not a question of whether the Soviet Union is encountering a leveling off and an inevitable diminution of their capacity to produce petroleum. Virtually unlimited natural gas supplies can compensate for some of this, but gas and oil are not totally interchangeable. What can we expect if we were to significantly reduce Soviet energy production—a more compliant Soviet policy toward Poland or a more aggressive effort for control over adjacent energy resources. To discourage, inhibit, threaten the development of Soviet petroleum must at best lead to their entrance into the commercial marketplace for Middle East oil and at worst and not unlikely by any means, to more irrational, dangerous Soviet efforts to expand their influence and control over international petroleum sources.

### WHERE ARE WE GOING

Mr. Chairman, your considerations today deal with an issue fundamental to our national security and our well being. Discussions of this subject must be brought back again and again to the basic question of effectiveness. Only after a searching assessment covering the entire range of the results of political intervention on international trade can an administration make a genuinely toughminded decision in the national interest. It should be recognized, Mr. Chairman, that an arbitrary, ill-considered, hip-shooting reach for the economic instrument is not tough. It is shortsighted with long-range costs which far outweigh any short-term political benefit. It is not the brave, but the cowardly action.

Linkage is not the point of the debate today. All respected specialists in Soviet affairs agree that linkage is a fact of life. Secretary Kissinger understood this point well. Interrelationships between trade and politics are real and permanent. It is in the question of evaluating the relative weight of each and how they interact where we have failed. Secretary Kissinger writes in his latest volume, "We did not believe that trade itself could moderate Soviet conduct. Our basic reliance was on resisting Soviet adventures and maintaining the global balance of power; economic incentives could not substitute for equilibrium. We believed however that Soviet restraint would be more solidly based if reinforced by positive inducements including East-West trade." Soviet leaders themselves have never minimized the linkage between political and economic goals.

It is very difficult to review this highly charged question in today's atmosphere in an objective manner. However, it is essential that we not be too intellectually proud to return to the basics and recognize that we are dealing with a question of what our policy toward the Soviets is to be. Do we: seek to destroy the Soviet system, to bring the Soviet Union to its knees (sic); do we pursue a policy of the carrot and the stick designed to moderate and reform the Soviet Union gradually but steadily into a cooperative member of the civilized world; or do we go the route of the carrot alone which amounts to unilateral disarmament. Under the Carter Administration tragically, we practiced the worst of all options, a policy of a diminishing stick and a limp carrot. Now we are reviving the stick (and I reiterate that this is essential in dealing with today's adversaries) but have abandoned the carrot virtually all together. For the 2 years I was stationed in our embassy in Moscow I had the honor to serve under one of our greatest career diplomats and, with all due respect to George Kennan and Chip Bolen, probably the most knowledgeable analyst of the workings of the Soviet system, Ambassador Llewellyn Thompson. It was my good fortune to participate with Tommy in our negotiations with the Soviet Union over Berlin at a particularly tense moment. One fundamental negotiating principle which I have never forgotten: Never, never put your adversary in a situation where there is no way out. Incentives are critical to balance threats and pressures.

In my personal judgment, Mr. Chairman, the Soviet system does not pose an ideological threat to the United States. It is rather a pure and often sordid power system. It is not the ideas of Marx and Lenin which threaten the U.S. national interest, it is power. It's important to accept that the Soviet Union is powerful, that their people are proud and patriotic, accustomed to sacrifice, longing for creature comforts and even freedom in their own terms. Given these facts we come back to the basic question of effectiveness. How do we influence the Soviet Union effectively. In my judgment the combined carrot and stick is the only effective option. Kissinger recalled the loss of our carrot in 1974. "Our policy toward the Soviets was based on a balance between the carrot and the stick. But we failed to produce MFN; we seemed to be unable to organize the financial mechanism for even such trade as there was—and all this despite Soviet concessions on Jewish emigration that would have been considered inconceivable a few years earlier. By summer of 1974 the carrot for all practical purposes had ceased to exist. (The Trade Bill passed with the Jackson amendment at the end of 1974. Emigration from the Soviet Union fell to 13,200 in 1975, down more than 20,000 from the peak of 1973.)"

Trade is an important instrument, but not when used as a two-by-four which some brash young members of this Administration brag has at least gotten our allies' attention! Trade is a long-range fundamental weapon of significant potential if used prudently and understood.

Business with the U.S.S.R. is only good business if it supports U.S. national interests—let there be no doubt about that. Most major U.S. corporations and all U.S. Administrations dating back to President Eisenhower have recognized that while we must contain (to use George Kennan's concept) or neutralize Soviet military power, we must at the same time seek to draw Moscow into the civilized world and achieve increasing confidence and cooperation or we are doomed to inevitable nuclear conflict. Students of the Soviet Union have long emphasized the vulnerability of Moscow's closed society to the pull of Western influence; culture, travel, consumerism, and above all, freedom. In short the more contact, over the long run, the less danger of conflict through misjudgment and the better the prospects for genuine change within the Soviet Union. In my judgment we have seen some progress over the past 30 years. I am convinced that growing trade in non-strategic goods is a prime instrument for this policy.

### A FEW RECOMMENDATIONS

In closing Mr. Chairman, I would like to make three brief recommendations: First, consultation. I spent many long hours with this committee and its superb dedicated staff, many of whom are still here today and still good friends of mine. Pursuing the elusive goal of consultation, you all taught me as no one else could, is just as essential in developing international economic policy as it is in building congressional support for a national policy.

Consultation means sharing the development of a policy, creating a strong vested interest in its success. As you and your distinguished predecessor Senator Sparkman have told me, sometimes rather sharply, you want to be in on the take-off, not just notified when the aircraft is about to crash.

As we look back on our economic initiatives directed at the Soviet Union beginning in Afghanistan and subsequently in response to the repressive measures of the Polish military regime, we find very little consultation. Instead we have shown a determined go-it-alone, let's-teach-them, be-a-leader attitude which has predictably produced disarray and weakened our Western alliance.

Second, I have touched on the criticality of foreign currency in the Soviet economic system. Moscow's hard currency shortage does constitute vulnerability. While small in volume, foreign equipment does provide the critical extra element which frequently saves inefficient Soviet economic projects from failure. It is essential in considering Western credit financing policies to work until we succeed in developing an allied consensus. A common Western credit policy designed to cut back and eventually abolish subsidized financing would force the Soviet Union to pay the true economic price of trade. In fact a good argument can be made and has been attempted by past Administrations to apply that principle to all trade with all nations. Certainly if we are seeking sensitive points in the Soviet economic system, this is one where action, if taken in unity, can produce results without the disproportionate costs of the arbitrary economic embargoes we have tried in the past.

Finally, Mr. Chairman, I strongly recommend that we eschew, once and for all, actions which amount to no more than a Sunni rain dance; an event which has no effect on the weather, but brings a certain sense of comfort to the members of the tribe. Empty gestures, unilateral actions which ignore the economic and political realities of the Soviet Union are not the way to influence Soviet policy.

The **Chairman**. Thank you very kindly for a very strong statement.

Dr. Wolf.

## STATEMENT OF DR. CHARLES WOLF, PROGRAM DIRECTOR, INTERNATIONAL ECONOMIC POLICY PROGRAM, DEAN, THE RAND GRADUATE INSTITUTE, THE RAND CORP., SANTA MONICA, CALIF.

Mr. WOLF. Thank you, Mr. Chairman and members of the committee. I would like to express my appreciation also for this privilege and opportunity of appearing before you to discuss with you the subject of East-West economic relations.

Mr. Chairman, like Mr. Jenkins I did not have time to prepare a short statement and the one that I have is really too long to read into the record. So with your permission, I would like to file it for the record and confine my remarks to the highlights or the main points in the fuller statement.

Mr. CHAIRMAN. Of course. Your full statement will be incorporated in the record.

Mr. WOLF. Thank you.

The points I would like to make are divided into three parts. In the first part, I would like very briefly to review the efforts in the 1970's to influence Soviet behavior by concessionary economic measures, and their lack of success.

In the second part, I would like to outline very briefly three broadly different orientations with respect to East-West economic relations: First, a policy of subsidization to encourage economic transactions; second, a policy of embargoes or sanctions to foreclose them; and third, a policy of avoiding both subsidization and embargoes in favor of a market regime based on strict cost and yield considerations. I will argue for the third of these policies and suggest some rules of the game for implementing it.

Then finally, I will deal with three alternative hypotheses concerning the effects of economic measures on Soviet behavior, and I will indicate which one of these I believe is most prudent to adopt.

As you recall, Mr. Chairman and gentlemen, the basic premise underlying détente in the 1970's was that by weaving a "web of relationships," in Secretary Kissinger's artful phrase, between the West and the East—political, cultural, scientific, arms control, and especially economic and commercial relationships—a number of highly desirable consequences and effects on Soviet behavior would ensue. It was hoped that Soviet behavior externally would be moderated, that there would be a diminished concern with military buildup, there might be some easing of the repressiveness of the Soviet system at home, and there might be the development of some degree of pluralism within the countries of Eastern Europe and between them and the Soviet Union.

By and large, there are major differences between the ways in which we and our European allies read the record of détente, and I go into those sharp differences in the statement, which I will not repeat here. I think in sum it is fair to say that most of us in the United States, perhaps with some demurrals, view the consequences of this policy of détente as perverse, that rather than having the effects on Soviet behavior that had been hoped for, the consequences have been deleterious to the interests of the West.

Instead of a decline in military power, we have seen a sustained military buildup. We have seen a rate of growth in Soviet military spending that is larger than the rate of growth in the Soviet national product over the last decade. We have seen the growth of both nuclear and conventional projection forces. We have seen the invasion of Afghanistan, the repression of Solidarity in Poland and the imposition of martial law. We have seen the expansion of the Soviet empire in Angola, Ethiopia, South Yemen, Madagascar, Southeast Asia, and so on.

And we have also seen the expansion of Soviet and Eastern European debt to the West of over $80 billion, of which about a quarter is owed by the Soviet Union and the remainder by the countries of Eastern Europe. And we have begun to worry that this debt makes our European allies hostage to Soviet influence and pressure.

I think we are concerned that the limited and short-lived reactions of our European friends to the Soviet invasion of Afghanistan, as well as to the imposition of martial law in Poland are confirmation of precisely the sort of hostage effects we have been concerned about. I think then that most of us—and I would include myself in that characterization—have concluded that détente and its fundamental premise have been weighed in the balance and found seriously wanting.

We have concluded that we should envisage changes in our relations with the Soviet Union in general and in our economic relations in particular. We have concluded—and I believe the evidence amply warrants our so concluding—that the policy of seeking to influence and moderate Soviet behavior by encouraging expanded economic relationships has failed badly, so badly that its underlying premise should be discarded.

Instead, I believe we should restrict resource flows from the West to the East—covering trade, technology and especially credits—while trying to limit the undersirable side effects that might ensue from this action in the alliance, in the international financial system and elsewhere.

The purpose of reducing and restricting such resource flows is to constrain Soviet allocation decisions, to impede the management and expansion of the Soviet empire, and hopefully rather than assuredly to bring pressure to bear in the longer run on the continuing Soviet military buildup. Such a policy of resource restrictions would shrink the possibilities open to the Soviet Union for reconciling continued expansion of its military capabilities with the competing demands of consumption, investment, and economic growth at home, and of its expanded empire abroad.

Let me turn next to the second part of my remarks and distinguish three broadly differing policy orientations with respect to East-West economic relations. Policy A is a policy of subsidization by governments to encourage West-East economic transactions and resource flows. Policy B is a policy of embargoes or sanctions to cut off such resource flows. And policy C would call for removing subsidies and avoiding embargoes while letting the market function to facilitate or to foreclose particular transactions in accord with the differing economic conditions and prospects of the Eastern European and Soviet economies.

Senator **Tsongas**. May I be so rude as to interrupt you for a moment? I have a 12 o'clock conflict, but I would simply state to Senator Mathias and Senator Pell that we have requested that the

CIA briefing that we had yesterday be sanitized and released, and would you want to join in that request?

And I apologize for the interruption, Dr. Wolf.

Senator MATHIAS. Yes. I would like not only to join in that request, but to make it required reading in certain parts of this community.

The CHAIRMAN. Dr. Wolf, have you finished your testimony? I am sorry that I had to slip out of the room for an emergency call.

Mr. WOLF. Policy A, subsidization, was the policy pursued by the West in the 1970's. As I have previously suggested, it has been notably unsuccessful, if not perverse, in affecting Soviet behavior in the ways that I have indicated. I think it is ironic to note in passing that some of those who are now most vocal in opposing the use of restrictive economic policies toward the Soviet Union in an effort to influence its behavior, were most vocal advocates of using concessionary economic measures to affect Soviet behavior along congenial lines in the 1970's.

Policy B, the policy of embargoes, and policy C, a strict market regime, would represent a restriction of West to East resource flows compared with the subsidization policy, although the side effects of the two policies, embargoes and the market regime, are likely to differ quite sharply. Opposition within the alliance, for example, to the market regime would be more limited than opposition to the policy of limited embargoes, as we have seen in the extraordinary reaction of our European allies to the June 18 embargo by the President.

Among the three policies, I favor the third one, that is the market regime, and very strongly oppose the subsidization policy that has been tried in the past. Now, this probably seems like a rather bland prescription, and a predictable one, to present to you. But it is only bland when you deal with general principles.

When you get to the specifics, there is ample room for controversy, and I would like to get to those specifics. What I have in mind, Mr. Chairman, is to put some teeth into a general policy of withdrawing subsidies and moving toward a strict market regime. Toward this end, I think it is important to establish rules of the game for ourselves and, to the extent possible, for our allies in conducting East-West economic relations, and to try insofar as possible to get agreement on these rules within the alliance.

If this agreement is not forthcoming, I would suggest—and we may want to discuss this further—that the United States should itself pursue and apply these rules, after consultation, but unilaterally. The following are some examples of what I would suggest as rules of the game for East-West economic transactions:

First, no loan or investment guarantee should be available to Western lenders or investors engaged in transactions with the East, unless these guarantees are extended without direct or indirect government underwriting, that is unless they are underwritten by the private insurance market.

Second, no concessionary interest terms should be available to either government or commercial borrowers in Eastern Europe or the Soviet Union. A minimum criterion for the implementation of this rule should be that interest rates applying to loans to Eastern Europe and to the Soviet Union should certainly not be less than the highest rate charged to domestic or foreign borrowers on loans of equivalent duration.

And third, no preferential tax treatment should be accorded to either individual or corporate income derived from transactions with Eastern Europe or the Soviet Union.

Now it may seem incongruous, if not inconsistent, to argue for a market regime on the one hand and then to propose rules of the game for regulating the market on the other. I think the reconciliation of that apparent inconsistency lies in the fact that over the past two decades both the United States and our allies in Western Europe have generated a network of direct and indirect subsidies, many of which reflect governmental efforts to promote exports and international investments in general, and these subsidies distort normal commercial incentives to engage in transactions with the Soviet Union and Eastern Europe.

There is one additional rule, which I am sure will generate controversy, that I would like to bring to your attention. This rule would move more in the direction of policy B, namely sanctions, and would at the same time render unnecessary several of the rules I have previously proposed.

This additional rule would simply exclude for the indefinite future any new credits to the Soviet Union, and perhaps also selectively to some of the countries of Eastern Europe. Trade would not be embargoed. Indeed, it might even be encouraged. But it would take place exclusively on a current cash basis.

Why consider such a severe measure? I think the answer is that credits, in whatever form and even if unsubsidized, enable the Soviet Union to import more than it exports, thereby expanding the net resources on which it can draw. Instead, reducing these resources should, for reasons I have mentioned earlier, be an important objective of Western policy. Excluding new credits would contribute to this objective.

Now, there are a lot of questions raised by such a no-new-credit rule, which I would be glad to discuss later, although I think a good deal more thought has to be given to them than I have been able to give to them. But I will not have time to consider them at this point.

Finally, let me turn to the question of the effects on Soviet behavior of restricting resource flows. As I have suggested, in comparison with the policy of subsidization, a policy of either rigorously relying on the market, with or without a no-new-credit proviso, would restrict or impede resource flows from West to East, and would be so perceived by the Soviet Union.

How would the Soviets' behavior be affected by such a policy? There are three hypotheses concerning the effects of such a restrictive policy on Soviet behavior, which exhaustively define the range of possibilities.

The first hypothesis is that such a policy might be so provocative that the Soviets would actually devote even more efforts in military spending and external mischief, notwithstanding diminution of their aggregate resource base.

The second hypothesis is exactly the opposite, namely that the Soviets might instead adopt a more accommodating and conciliatory stance if they became convinced of the firmness and the credibility of Western and U.S. intentions.

The third hypothesis is, to use slightly technical jargon, the null hypothesis. Soviet behavior and Soviet preferences may not be discernibly affected at all by this policy. In general, where the evidence in support of either of the other hypotheses is inconclusive, one should not reject the null hypothesis that says, in effect, Soviet behavior will not change from what it otherwise would be. Instead, Soviet behavior may be impelled by internal pressures, forces and factions, and the relative strength of these is unlikely to be influenced by Western economic policy.

I have heard plausible arguments advanced in support of the first two, mutually inconsistent hypotheses. My own inclination runs strongly toward supporting the null hypothesis until there is much stronger evidence than anyone has thus far produced in favor of one of the other two hypotheses.

Mr. Chairman, this conclusion seems to me to argue very strongly in favor of the policy direction that I have been proposing to you. At least, a policy of restricting resource flows by removing all the subsidies that have affected such flows in the past and perhaps by adding the no-new-credit proviso that I have suggested, would place greater pressure on the Soviet economy in the middle and longer run.

Such a policy would thereby tend to expose the inherent, dialectical contradictions within the Communist system. This is certainly not a policy for bringing the Soviet Union to its knees, or bringing about the collapse of the Soviet system, as some of the media's caricatures of this policy have occasionally portrayed it.

Indeed, the effects on Soviet behavior of a policy of resource restriction will be modest and gradual, and will be felt, if at all, only over the long run. In any event, we should not try to outdo Lenin's forecast by subsidizing the rope with which to hang ourselves. Moreover, if any anticipation of the internal contradictions within the Soviet system are correct and the rope is priced according to proper market criteria, the Soviets are not likely to be able to afford it.

Thank you, Mr. Chairman.

[Dr. Wolf's prepared statement follows:]

### PREPARED STATEMENT OF CHARLES WOLF, JR.[1]

Mr. Chairman, and members of the Committee, I want to express my appreciation for the opportunity to appear before this distinguished committee, and to comment on the subject of East-West economic relations, with which you are concerned.

In the following remarks, I will try to make three points. First, I will briefly review the efforts of the past decade to influence Soviet behavior by concessionary economic measures, and will suggest that these efforts have been notably unsuccessful.

Second, I will outline three broadly differing positions with respect to economic policies toward the Soviet Union: (1) Subsidization to encourage East-West transactions; (2) Embargoes or sanctions to foreclose such transactions; and (3) Avoiding both subsidies and embargoes, while letting the market function to allow or restrict transactions in accordance with rigorous cost and yield considerations.

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[1] Charles Wolf, Jr. is Dean of The Rand Corporation's Graduate School, and director of Rand's research program on international economic policy. Comments in this statement are the author's views, and not necessarily those of The Rand Corporation or any of its research sponsors.

In general, I will argue in favor of the third of these positions and will suggest some stringent "rules of the game" for implementing it.

Finally, I will briefly consider several different hypotheses relating to the possible effects on Soviet behavior of policies that reduce or restrict West to East economic transactions. I will indicate which of these hypotheses it seems to me most reasonable to adopt.

I. *Détente and the failure to influence Soviet behavior by economic concessions.*—The basic premise underlying détente in the 1970s was that weaving a "web of relationships" (in Henry Kissinger's phrase) between the Soviet Union and the West—political, cultural, scientific, and especially economic relationships—would have many desirable consequences: moderating Soviet behavior abroad; easing of repressive control within the Soviet system at home; and developing some degree of pluralism within the countries of Eastern Europe and in their relationships with the Soviet Union.

By and large, there are sharp differences between our Western allies and most of us in the United States in our respective evaluations of the results of détente, and the validity of this underlying premise. Our European allies look at the world through lenses that are quite different from ours, and they focus on quite different events and experiences from those we tend to emphasize. They see and commend the development of Solidarity in Poland prior to December 13, 1981, the development of decentralized, market decisionmaking in the Hungarian economy, and the seeming independence of Rumania's foreign policy. Our allies, especially the Federal Republic of Germany, also see the humanitarian as well as the political benefits of reuniting 200,000 German families previously separated by the barriers between the FRG and East Germany.

Moreover, our European allies see all this as having come about notwithstanding a relatively small volume of trade between Western Europe and the countries of Eastern Europe and the Soviet Union, amounting to less than 5 percent of Western Europe's total external trade. And finally, they see the clear signs of weakness, as well as the declining prospects, of the Soviet economy reflected in its low and decreasing rate of growth, declining productivity, increasing capital-output ratios, repressed inflation, and labor shortages. Our European friends infer, perhaps wishfully, that the Soviet Union may not be such a serious threat and adversary.

By contrast, I think most of us in the United States see a different set of consequences, or at least concomitants of détente. We see instead the tremendous buildup of Soviet military power, both nuclear and conventional, as well as a rate of growth in Soviet defense spending throughout the decade somewhat greater than the rate of growth in Soviet GNP, and a level of Soviet military investment many times larger than our own.

We see also the Soviet invasion of Afghanistan in 1979, the imposition of martial law and the repression of Solidarity in Poland after December 13, 1981, and the continued expansion of the Soviet empire, in Angola, Ethiopia, South Yemen, Laos, Cambodia, and Nicaragua, in addition to maintaining its prior dominion in Eastern Europe and Cuba, and its delicately balanced relationship with North Korea.

We also see the tremendous expansion of debt owed to the West by Eastern Europe and the Soviet Union, currently amounting to over $80 billion, of which three-quarters is owed by the Eastern European countries, and the remainder by the Soviet Union. We worry that this debt makes our European allies hostage to Soviet influence and pressure. And we see the limited, as well as short-lived, reactions of our European friends to the Soviet invasion of Afghanistan, and to martial law in Poland, as confirmation of precisely the sort of hostage behavior we have been concerned about.

In sum, the countries of Western Europe conclude—by and large, and with some differences among and within them—that détente, and its underlying premise about the "web of economic relationships," were valid and useful in the 1970's and remain applicable in the 1980's.

By contrast, we in the United States—by and large, and also with differences among us—have concluded that détente and its premise "have been weighed in the balance and found seriously wanting." We have concluded that we should envisage drastic changes in our relations with the Soviet Union in general, and in our economic relations in particular. We have concluded, and I believe the evidence amply warrants our so concluding, that the policy of seeking to influence and moderate Soviet behavior by encouraging expanded economic relationships has failed badly—so badly that its underlying premise should be discarded.

Instead, I believe we should restrict resource flows from the West to the East—covering trade, technology and especially credits—while trying to limit the undesirable side effects that might ensue from this action in the alliance, in the international financial system, and elsewhere.

The purpose of reducing and restricting such resource flows is to constrain Soviet allocation decisions, to impede the management and expansion of the Soviet empire, and hopefully rather than assuredly, to bring pressure to bear in the longer run on the continuing Soviet military buildup. Such a policy of resources restriction would shrink the possibilities open to the Soviet Union for reconciling continued expansion of its military capabilities, with the competing demands of consumption, investment, and economic growth at home, and of its expanded empire abroad.

II. *Alternative policy positions.*—It is useful to distinguish three, broadly differing orientations toward East-West economic policies: it is also possible, and probably useful, to consider various combinations among the three: (a) Subsidization by governments to encourage West-East economic transactions and resource flows; (b) Embargoes or sanctions to cut off such resource flows; and (c) Removing subsidies and avoiding embargoes, while letting the market function to propitiate or to foreclose particular transactions in accord with the differing economic conditions and prospects of the Eastern European and Soviet economies.

Policy (A), subsidization, was pursued by the West in the 1970's; as I have previously suggested, it has been notably unsuccessful, if not perverse, in influencing Soviet behavior along the congenial lines that were hoped for.

Policy (B), embargoes, and policy (C), a strict market regime, would represent a restriction of West to East resource flows compared with the subsidization policy. Clearly, the side effects of policies (B) and (C) are likely to differ quite sharply: opposition within the alliance to policy (C), would be more limited than opposition to policy (B), as we have seen in the extraordinary reaction of our European allies to the July 1 embargo by the President on GE turbines for the Yamal pipeline. (I will not address in these opening remarks, the issue of the pipeline and the embargo action as a means of applying symbolic and economic pressure on the Soviet Union for the failure to withdraw martial law in Poland. However, I will be glad to return to this in the discussion, if it would be helpful to do so.)

Among the three policies, I favor policy (C), the market regime, and very strongly oppose the subsidization policy that has been tried in the past. This position may seem rather bland. Actually, avoiding subsidization and favoring a strict market calculus is somewhat like balanced budgets and motherhood: most people express support for the principles, until specific issues come up—such as constitutional amendments to balance the budget, or access to Medicaid for purposes of abortion. When such specific issues are addressed, heated controversy and profound differences of view begin to emerge.

The situation is similar with respect to the principle of avoiding subsidies and relying on a market calculus to govern East-West transactions: most people express general support for the principle, but when specific issues are addressed, sharp differences emerge. For example, the Germans argue that the loan guarantees extended by Hermes do not represent a subsidy, but simply constitute a normal means of carrying on international trade. And the French say that charging the Russians an interest rate of 9 or 9½ percent on loans connected with the Yamal pipeline does not represent a subsidy, and, in any event, is a higher rate than the Germans are charging!

What I have in mind is to put some teeth into a general policy of withdrawing subsidies and moving toward a strict market regime. Toward this end, I think it is important to establish "rules of the game" for conducting East-West economic relations and to try, insofar as possible, to get agreement on these rules within the alliance. If this agreement is not forthcoming, I think the United States should pursue and apply these rules unilaterally, if necessary. The following are some examples of what I would suggest as rules of the game for East-West economic transaction: (1) No loan or investment guarantee should be available to Western lenders or investors engaged in transactions with the East, unless these guarantees are extended *without* direct or indirect government underwriting; (2) No concessionary interest terms should be available to either government or commercial borrowers in Eastern Europe or the Soviet Union. A minimum criterion for the implementation of this rule should be that interest rates applying to loans to Eastern Europe and the Soviet Union should certainly not be less than the highest rates charged to domestic or foreign borrowers on loans of equivalent duration; and (3) No preferential tax treatment should be accorded to either individual or corporate income derived from transactions with Eastern Europe or the Soviet Union.

It might seem incongruous, if not inconsistent, to argue for a strict market regime, on the one hand, and yet to propose rules or regulations to govern East-West transactions, on the other. But such rules are necessary because Western European governments, and to a lesser extent even the U.S. Government as well, have developed over the past several decades a pervasive network of subsidies that distort normal commerical incentives to engage in transactions with the Soviet Union and other CMEA countries. These subsidies—many of which reflect governmental efforts to promote exports and international investments, in general—include the following: lending at preferential rates and providing loan guarantees (e.g., through the Commodity Credit Corporation in the United States, and through COFACE in France, and Hermes in West Germany), subsidized lending (e.g., through the Export-Import Bank, or other similar institutions in Western Europe and Japan); investment guarantees underwritten by government agencies; and preferential tax treatment of foreign business income (e.g., through such devices as the Domestic International Sales Corporation program) and of personal income received by citizens working abroad (e.g., in the Soviet Union or Eastern Europe).

These subsidies are, in the final analysis, borne by the taxpayers of the countries concerned, in the form of higher budgetary or, in the U.S. case, "off-budget" expenditures. Indeed, the pervasiveness and subtlety of such subsidies is so extensive that, for example, there is probably nobody in Western Europe, and certainly not in the United States, who knows the actual size of the net subsidy that is built into the vastly complicated Yamal pipeline agreements! Ironically, the Soviet Union is probably the only party to this transaction which possesses all the information necessary to make such a calculation.

To offset and gradually reverse this pattern of subsidies, some "rules of the game," such as those I've proposed, would be highly desirable.

There is one additional rule I would like to bring to your attention. By moving more in the direction of policy (B), sanctions, this rule would render unnecessary several of the rules I have previously proposed.

This rule would simply exclude for the indefinite future any new credits to the Soviet Union, and perhaps also, selectively, to some of the countries of Eastern Europe. Trade would not be embargoed, but it would take place exclusively on a current, cash basis. On this basis, trade might even be encouraged.

Why consider such a severe measure? The answer is that credits, in whatever form and even if unsubsidized, enable the Soviet Union and the other CMEA countries to import more than they export, thereby expanding the net resources on which they can draw. Instead, reducing these resources should, for reasons I've mentioned earlier, be an important objective of Western policy. Excluding new credits would contribute to this objective.

There are numerous questions which such a rule raises. They require more attention and time than I can give them here. For example, how enforceable would a "no-new-credit" rule be? To what extent would arbitrating of loans by third countries weaken or negate the rule itself? How much would this rule reduce incentives of the Soviet Union and other CMEA countries to repay their existing debts? Would such a policy be worth pursuing unilaterally if, as is likely, some or most of our European allies would not adopt it?

Some of these questions, especially the last one, may be worth pursuing in the discussion period.

III. *The effects on Soviet behavior of restricting resource flows.*—In comparison with the past policy of subsidization, a policy of rigorous reliance on the market, with or without a "No-new-credit" proviso, would restrict or impede resource flows from West to East, and would be so perceived by the Soviet Union. How would Soviet behavior be affected by such a policy?

It may be worthwhile, first of all, to decompose "Soviet behavior" into the component parts we might wish to affect: (a) its military effort and buildup, both conventional and nuclear; (b) its direct and indirect use of military power in various parts of the world, such as Afghanistan; (c) its persistent efforts to expand its empire and influence abroad; and (d) the repressiveness of the Soviet system, both at home and in Eastern Europe.

Three hypotheses can be formulated concerning the likely Soviet response, and each has some support. The first hypothesis is that such a policy may be so provocative that the Soviets might actually devote even more effort to military spending and external mischief, notwithstanding diminution of their aggregate resource base.

The second hypothesis is that they might, instead, adopt a more accommodating and conciliatory stance, if they became convinced of the firmness and the credibility of Western and U.S. intentions.

The third hypothesis is, to use slightly technical terminology, the "null" hypothesis: Soviet behavior and Soviet preferences may not be discernibly affected by this policy, at all. In general, where the evidence in support of either of the other hypotheses is inconclusive, one should not reject the (null) hypothesis that says, in effect, Soviet behavior will not change from what it would otherwise be.

Instead, Soviet behavior may be impelled by internal pressures, forces, and factions, and the relative strength of these is unlikely to be influenced by Western economic policy.

I have heard plausible arguments advanced in support of the first two, mutually inconsistent hypotheses. My own inclination runs strongly toward supporting the null hypothesis until there is much stronger evidence than anyone has thus far produced in favor of another hypothesis. Soviet priorities and Soviet behavior are likely to be governed by factors inherent in the Soviet system, rather than by changes in Western economic policy.

This conclusion seems to me to argue very strongly in favor of the policy direction that I have been proposing to you. At the least, a policy of restricting resource flows, by removing all the subsidies that have affected such flows in the past, and perhaps by adding the "no-new-credit" proviso, would place greater pressure on the Soviet economy in the middle and longer run. Such a policy would thereby tend to expose the inherent, dialectical contradictions within the Communist system. This is certainly not a policy for bringing the Soviet Union "to its knees," or bringing about the "collapse of the Soviet system," as some of the media's caricatures of the policy have occasionally portrayed it.

Indeed, the effects on Soviet behavior of a policy of resource restriction will be modest, and gradual, and will be felt, if at all, only over the long run. In any event, we should not try to outdo Lenin's forecast by subsidizing the rope with which to hang ourselves! Moreover, if my anticipation of the internal contradictions within the Soviet system are correct, and the rope is priced according to proper market criteria, the Soviets are not likely to be able to afford it.

The CHAIRMAN. Thank you very much, Dr. Wolf.

Mr. Hewett.

Senator MATHIAS. Mr. Chairman, as Mr. Hewett begins, let me commend his excellent testimony of about 10 days ago before this committee on the subject of the pipeline. I think it enhances the value of any testimony he gives today.

Mr. HEWETT. Thank you very much, Senator.

The CHAIRMAN. Again, thank you, Dr. Wolf, for your very fine testimony.

Mr. Hewett, we welcome you to the committee.

## STATEMENT OF EDWARD A. HEWETT, SENIOR ECONOMIST, THE BROOKINGS INSTITUTION, WASHINGTON, D.C.

Mr. HEWETT. Thank you very much. I will summarize my written statement and ask that my full statement be incorporated into the record.

The CHAIRMAN. Your full statement will be incorporated.

Mr. HEWETT. My testimony today addresses the issue of whether or not Soviet behavior can be influenced by economic pressure. I will resist the temptation to simply say that I agree with Dr. Wolf and will discuss in somewhat more detail my views on this, which are very close to his.

Those who believe that Soviet behavior can be influenced by economic pressure are making three assumptions about the Soviet Union: The first is that if the West can somehow act in unison to manipulate East-West economic relations that significant costs can be imposed on the Soviet economy. That was discussed by the first panel and I will not discuss it today.

The second proposition is that Soviet leaders must respond to the imposition of these costs by diverting resources from the military to the civilian sector, because other alternatives are closed off by political or technical constraints. The third proposition is that reduced growth of military expenditures will somehow cause a change in Soviet foreign policy.

I will discuss these last two issues briefly in my statement. The first, and I think most important, point to make is that the main determinants of Soviet economic performance are internal to the Soviet economic system and have virtually nothing to do with the foreign sector. Rather, those major determinants have to do with long-term demographic developments, exogenous factors such as weather, developments in the world economy, and the way Soviet leaders organize the system and set policies within that system.

It is those determinants that have been deteriorating over time and which explain the fact that the Soviet Union is experiencing a long-term slowdown in its economic growth. GNP growth rates, which averaged 5 percent per annum in the sixties, averaged 3 percent in the seventies and will most likely average 2 percent in the eighties. The reasons for that have to do with things that Mr. Jenkins discussed briefly and which I will not go into in any detail here, but such things as the growth of the labor force, the higher cost of energy, problems in productivity growth rates, possibly even more severe than we have experienced in the United States, the increased cost of empire, and the fact that this is an aging leadership with a very inflexible bureaucracy difficult to control.

These trends are likely to continue no matter what we do in the West, no matter what policies we set. If we chose any of Dr. Wolf's options, Soviet growth trends in the near term would be just as I have laid them out, because we cannot exert significant influence on these trends.

Soviet leaders are currently faced with some very difficult choices between the competing demands of consumers, the military, investors, and Soviet client states, most notably in Eastern Europe and Cuba. They are currently making choices among those competing demands, and someone is going to have to accept a drop in their real income of considerable significance and which is indeed happening and has been over the last few years.

These economic prospects, however, are not enough for the Reagan administration. They have decided that it is necessary, even at the cost of some of our very long-term relationships with our allies in Europe, to seek to exacerbate Soviet economic problems.

The theory is that our actions, combined with these economic prospects, which the Reagan administration is certainly well aware of and perhaps overly impressed with—the theory is that our actions will force the Soviet Union to divert resources from the military and from their client states, because they have no other choices.

Well, whatever the Reagan administration does, as I have said the basic issue is indeed how the Soviets are going to respond to the very bad situation that they are in now, a situation that will get worse. But the Reagan sanctions do introduce a new element and one that we need to discuss. Will the obvious imposition of sanctions by the United States force Soviet leaders to do things that they would not otherwise do? That is, will those sanctions act as a catalyst. Indeed I think that they will.

From what we have seen so far of Soviet leaders' responses to now 3 years of very bad economic performance, they certainly are inclined to protect consumers. They were inclined to do that before Poland and are even more inclined to do it now.

Second, it is true that they are inclined to go to client states and reduce the subsidies to those states. We have already seen a reduction in subsidies to Eastern Europe and will probably see further reduction's in this decade. But I would emphasize that this reduction in subsidies will not be large enough to allow the Soviets to avoid the very difficult choice they are going to have to make between investors, consumers, and the military.

I think the Soviet leaders' inclination, and indeed the economics of the situation, would suggest that they will therefore ask investors to give up some of their resources. The Soviet Union invests a third of its GNP, easily 10 percentage points higher than investment-GNP ratios in Europe and twice the investment-GNP ratio of the United States. Soviet leaders are convinced there is some slack in that ratio, and indeed there may be.

But let us suppose that there is not enough and that they still must make the very difficult choice, which ultimately comes back to the military versus the consumers. At that point I think they really have three options. One of them is to go ahead and to protect consumption and reduce military expenditures. The second is to do the reverse, to protect the military and reduce consumption expenditures. The third option is economic reform. I will talk about each of those briefly.

I think the first option, that is to protect consumers and reduce military expenditures, is an option that just might be plausible for Soviet leaders if we were in a period of détente. But it is virtually impossible right now to conceive of a Soviet leadership that had any designs to stay in office cutting military spending in the face of the current policies of the Reagan administration. And so I think the policies, and particularly the sanction policy, but others also, have really foreclosed this option for Soviet leaders, forcing them to choose between two less pallatable ones from their point of view.

The second option would be to cut consumption and protect military spending. That I think during a period of détente would be a difficult option to pursue, because politically it would be very difficult to sell domestically. Now it is easier to sell. What the Reagan administration has provided Soviet leaders is assistance in doing something they would find very difficult to do otherwise, that is to tell consumers in the short run that they need to accept virtual stagnation in living standards because there is an external threat and a need to respond to that external threat.

But that itself would not be a good long-term policy. Obviously, consumers will not support such a policy over the long run. They do have the notion that they want their living standards to increase rather regularly.

The way Soviet leaders therefore will have to deal with that is to go the third option, that of economic reform. I will not go into any of the details on this. I would simply say that possibly the greatest weakness of the Soviet economy today is the rather absurd way that that economy is organized, the way the resources are allocated there. But it is also potentially the greatest strength, because if they could ever muster the political will to make major changes in that system they would unleash forces of creativity that would give them much higher GNP growth rates, much higher productivity growth rates, possibly even lower rates of investment.

Soviet leaders do not want to go that route because politically there is a great deal of risk involved in it. They could lose a good deal of their authority in the system. But we may force them along that route, and indeed I think their own economic problems will force them along. It is only a question of time.

If my analysis is right, the Reagan administration's policy toward the Soviet Union is very strange indeed. We are risking important relationships with Europe in order to marginally aggravate a situation that is already deteriorating in the Soviet Union, and in fact our intervention could somehow allow Soviet leaders to do what otherwise they could not do, namely to impose upon consumers a tax to finance further increases in military spending and move toward economic reforms more rapidly than they might otherwise do.

Certainly President Reagan's policies in and of themselves will not affect military spending, because, in the first place, Soviet leaders——

Senator MATHIAS. Will not?

Mr. HEWETT. Will not affect the growth rate of military spending. Soviet leaders have a number of options open to them, starting with investment, going to consumers, going to subsidies in Eastern Europe, and even finally in the economic system itself. All of these will be affected, in my view, before military spending will be affected.

For me the most depressing aspect of the current Reagan policy—and I am speaking here as someone who has worked in the Soviet economy for well over a decade—is the excessively simplified view of the Soviet Union that is implied in that policy. Presumably a basic tenet of warfare is that one should fully appreciate, if not overappreciate, the capabilities of his adversary, and indeed the Reagan administration appears to almost overdo this when they are attempting to justify here on the Hill further military spending increases.

And yet, in formulating its economic warfare policies the Reagan administration persists in underestimating the capabilities of the Soviet economy. We are virtually basing our policy toward the Soviet Union on a caricature of that economy, and a caricature that has very little fact supporting it. That is what allows the Reagan administration to overestimate the benefits of some of the costly policies they are now pursuing.

In my firm opinion, it is now time to move beyond caricatures of the Soviet economy and to base policy on a careful analysis of the rather rich complexity of that economy. If we do that, I think we will find ourselves eventually going toward Mr. Wolf's third policy option, and that is an option in which we try neither to influence Soviet behavior through offering carrots or sticks in East-West trade, but rather take almost a neutral policy to our East-West trade.

Thank you, Mr. Chairman.

[Mr. Hewett's prepared statement follows:]

## Prepared Statement of Edward A. Hewett

The Reagan Administration is convinced that the Soviet economy is vulnerable to economic pressures exerted through East-West economic relations, and that Soviet leaders will respond to those pressures in a predictable way which will serve U.S. policy interests. Europeans are skeptical on both counts, which is how close allies who share revulsion for events in Afghanistan and Poland can find themselves in such profound disagreement over what to do about it. All of our European allies are unwilling to join the Reagan Administration in embargoing equipment for the gas pipeline because they fear that the very substantial costs they will incur now (lost exports of at least $5 billion, lost gas imports later, and considerable irritation on the part of the Soviets) will bring forth no obvious benefits by changing the trend of events in Poland or Afghanistan. On a more general, but related, level the Reagan Administration has implied that it is a good idea to exert economic pressure on the Soviet Union in order to force Soviet leaders to choose between increases in defense expenditures and increases in living standards the supposition being that they must bow to increasingly insistent consumer demands, and therefore reduce the growth of Soviet military power.

These are very serious matters indeed which touch on the foundations of NATO, in particular those regarding the nature of the Soviet threat and the best way to deal with it. The Reagan Administration is isolated, yet apparently adamant, in its views. For both reasons it is important that we as Americans do all we can to explore the validity in the fundamental tenets of this policy, exposing weaknesses where they exist. This testimony, while too brief and general to do justice to that task, nevertheless does endeavor to ask some important questions and suggest what the answers might be.

Those who seek to use East-West economic relations to influence Soviet foreign policy implicitly assume that: (1) If western countries act in unison, then they can impose significant costs on the Soviet economy by manipulating East-West trade and financial flows; (2) Soviet leaders will be forced to respond to those increased costs by shifting resources from the military to the civilian sector, all other options being closed by political or technical restraints; and (3) Soviet leaders will become much more wary of foreign adventures, much less capable of shoring up regimes in Eastern Europe, and that therefore Soviet foreign policy will change in directions favored by the West.

The first point is the subject of other testimony at these hearings, and will not be discussed here in any detail. I would only note in passing that right now the United States and Europe are so deeply divided on the appropriateness of sanctions against the Soviet Union, that the only practical question is whether the United States alone can impose any long-term costs on the Soviet economy through embargoes which Europe and Japan ignore, and on this matter I am quite pessimistic.

Setting that aside, I turn now to the other two propositions. What are Soviet leaders' options should the United States succeed in "penetrating their economic defenses" and imposing on the economic system significant economic costs? And, as they choose among those options is it inevitable, or even likely, that they will feel compelled to change Soviet foreign policy either in order to avoid further costs, or because military capabilities are not sufficient to support their foreign policy goals?

In any discussion concerning how western countries can use East-West economic relations to influence Soviet economic performance it is important to realize that western policies regarding commerce with the U.S.S.R. are a relatively unimportant determinant of the level and growth rate of Soviet GNP. The Soviet economy is a huge, complex mechanism, which in 1980 had a GNP of approximately $1.4 trillion (about ½ U.S. GNP for that year). The system is enormously well endowed with natural and human resources, and it is organized through a political system which—albeit very inflexible—has nevertheless been up to the task of making the U.S.S.R. one of the major military powers in the world.

The major determinants of the level of economic activity in this system are internal, having to do with (1) how well or poorly Soviet leaders organize the economic system and set policies to guide the operation of the system; (2) factors out of the control of any leadership such as demographic trends, weather and world economic developments. In the last 3 years, for example, the major shock to the Soviet economy has not been two U.S. administrations' increasingly severe restrictions on East-West trade, but rather the very poor weather which has affected agricultural output, and therefore GNP.

Throughout the postwar period the Soviet economy has experienced a generally steady decline in growth rates of GNP reflecting unfavorable trends in the basic factors determining Soviet economic performance. (GNP growth rates averaged 5 percent in the 1960's and 3 percent in the 1970's. They are unlikely to surpass 2 percent in the 1980's.) The major problems here are: (a) low and declining growth rates in the labor force, with all new additions coming in the least industrialized areas of the U.S.S.R.; (b) a fall in productivity growth rates; (c) increasing economic difficulties in Eastern Europe, Cuba, and Vietnam, all of whom depend in varying degrees on Soviet largesse for maintaining living standards; (d) increasing costs of extracting and transporting raw materials and energy; and (e) an aging leadership with only a loose grip on a rigid bureaucracy, seemingly incapable of assessing and dealing with the fundamental causes of Soviet economic problems.

Some of these trends are out of the control of Soviet planners, but others could conceivably be reversed over time. For example, a new Soviet leadership could introduce radical economic reforms and as a consequence reduce trends in labor productivity growth rates, which would be an important step in reversing the downward decline in GNP growth rates. But there is no indication that the current leadership is inclined to take the necessary steps, and a new leadership would find it very difficult to do so until it had been in office for several years. Therefore the Soviet economy is in for a very grim decade indeed, no matter what policies Western governments pursue regarding East-West economic relations.

As a result Soviet leaders shall have to make, indeed are already making, some very unpleasant choices among competing claims from consumers, investors, the military, and Soviet client states (most notably Eastern Europe and Cuba). One, and probably two of these groups, will have to accept at least stagnation, and probably a drop in their real income from Soviet GNP.

The Reagan Administration is quite clear, in fact probably somewhat overly impressed, concerning the dismal economic prospects facing the Soviet economy. But for them this is apparently not enough. They seek to add to Soviet economic problems an unfavorable climate in East-West trade and finance, in order to hasten the decline of Soviet economic performance. Implicitly the theory is that the Soviets shall have to adjust to deteriorating economic performance by reducing the growth rate of military expenditures and support for client states. Consumers are regarded as adamant in their zeal to protect and improve their living standards, and investment demands shall have to rise if the economy is even to stand still.

However the current debate between Europe and the United States may come out concerning President Reagan's economic sanctions, the net impact on the Soviet economy from these sanctions is likely to be relatively minor in comparison to all of the other negative trends discussed above. Therefore the basic question we must ask is how Soviet leaders are likely to adjust to continuing economic difficulties, and in particular what impact these difficulties will have on military expenditures. A second and now very important issue is if U.S. economic policy succeeds in contributing to Soviet economic difficulties, can we be sure that Soviet planners will choose the same types of adjustment policies they would choose if the problems had primarily internal causes?

On the first point I would suggest that Soviet options are considerably broader than the Reagan Administration might suppose. It is certainly true that the political inclinations of Soviet planners will lead them to protect living standards as best they can, even to increase them by some modest amount, in order to avoid further dissatisfaction in any form resembling that which propelled the Polish regime to catastrophe. And indeed in the period since 1979 when GNP growth rates have averaged under 2 percent there is ample evidence that Soviet leaders are doing their best to insulate consumers from much (although not all) of the required adjustment.

Secondly it is also true that Soviet client states, in particular those in Eastern Europe, can expect to see subsidies from the U.S.S.R. fall somewhat. How far they fall depends on how far the Soviets think they can push individual East European countries without precipitating a serious economic/political crisis. Throughout this decade those subsidies shall probably have to remain fairly substantial, and therefore they will provide little relief in the event of persistent low growth rates.

Assuming that consumption continues to enjoy protection, that leaves investment and the military, and here it seems quite likely that Soviet planners will try first to freeze investment levels. Investment in the Soviet economy is currently 33 percent of GNP, easily 10 percentage points above investment rates in Europe, and double that of the United States. There is probably a good deal of slack in those figures, and Soviet leaders are virtually certain to look there before turning to a final and very hard choice between military and consumer needs. Indeed that seems to be the strategy in this 5 year plan (for 1981–85) where annual growth rates for investment are planned at about 1 percent, well below projected GNP growth rates.

If investment cannot provide the needed slack for adjusting to lower growth rates, and if therefore the choice is back to military or consumption, then I see three options for Soviet leaders: (1) to go ahead and cut the growth rate of military spending below its recent historical rate of 4 percent per annum, (2) to maintain that rate but cut the growth rate of consumption to below that of GNP, and (3) to introduce serious economic reforms which would boost labor force productivity and GNP growth rates, and which would therefore allow the Soviets to avoid the hard choices they otherwise would face.

In a world where United States-Soviet relations were characterized by some form of détente, Soviet leaders might be inclined to pursue the first option, simply because the other two options hold so many political uncertainties for them. But as long as the United States persists in its current policy of thinly veiled economic warfare against the Soviet Union and rapid increases in military spending, then the first alternative is out of the question for any Soviet leadership which wishes to stay in power. To choose such a path would be obvious capitulation in the face of U.S. coercion, and the Soviet economic situation is not nearly so desperate as to force that unpleasant task on the current leadership.

Although in a period of détente the second option (cutting consumption) would be politically quite risky for Soviet leaders, the current international climate increases considerably their latitude (and inclination) to impose austerity. U.S. administration policies give Soviet leaders ample ammunition to sell the Soviet population an economic policy which pursues high growth rates for the military and low consumption growth rates as a patriotic response to an external threat. In fact U.S. policy could well serve as a convenient scapegoat for poor Soviet economic performance, which in reality reflects weaknesses in the Soviet economic system. As a short-term policy, say through the mid 1980's, that might work rather well. As a longer term policy it would surely have its limits, in particular since the next U.S. election could well bring a shift away from open U.S. hostility to the Soviets, and to East-West relations.

That is why as a long-term policy the third option seems to be the likely one for the Soviet leaders to pursue. The rigidity of Soviet economic institutions imposes tremendous costs on Soviet economic performance. And if Soviet leaders are forced into economic reform as the only viable way to maintain the legitimacy of their regimes, they will probably find that serious reforms will unleash considerable creative forces, stimulating economic performance. The inefficiency of the Soviet economy is at once its greatest weakness and its greatest potential strength. Political leaders in the U.S.S.R. will not willingly choose to attack the fundamental source of inefficiency, in part because of the unforeseeable political consequences. But in the process of a leadership succession, and in the context of declining economic performance (possibly associated in part with U.S. policy), it is radical economic reform, rather than reduced military spending, to which Soviet leaders are likely to gravitate.

If this analysis of Soviet options is at all close to the mark, then the Reagan Administration's policy towards the U.S.S.R. is very strange indeed. The Administration is risking important relationships with Europe in order to impose costs on the Soviet economy which will only in a marginal way further aggravate an already deteriorating economic situation. By pursuing that path openly, and by enunciating other policies designed to impress the Soviets with U.S. determination to reattain military superiority, the United States will force Soviet leaders to do what otherwise might be hard or impossible for them to accomplish: tax consumers for high military expenditures in the short run, and introduce radical economic reforms in the medium term. Furthermore such a policy virtually guarantees an intensification of Soviet economic pressure in Eastern Europe with consequences which are not easily predictable. There is, as far as I can see, little thought given in this Administration to how Eastern Europe will fare in an economic war with the Soviet Union.

Certainly there is little prospect that current Reagan Administration policies will force the Soviet leaders to change any important aspects of their foreign policies in areas of fundamental importance to them, such as Afghanistan or Poland. In the first place it is unlikely, for reasons discussed above, that U.S. economic pressure can exert any perceptible influence on Soviet military expenditures. Even if we do manage to impose through our policies costs on the Soviet economy, it is consumers, investors, Soviet clients, and possibly even Soviet economic institutions which will take the brunt of the adjustment. If military expenditures are adjusted, it will be for far more fundamental reasons than a response to U.S. sanctions or U.S. displeasure with Soviet behavior.

It is even less likely that the Soviets will change their foreign policy in response to the threat of U.S. sanctions. This Administration is dangerously schizophrenic about the Soviet Union. On the one hand they contend that the U.S.S.R. is superior to the United States as a military power. Yet at the same time they contend that the economy is so fragile that the military power means nothing and that the threat of economic sanctions will so frighten the Soviets that they will change important aspects of their foreign policy. Such a proposition would be ridiculous were it not for the sad fact that it underlies current U.S. policy.

Although I am not myself trained in military matters, I presume it is regarded as the most elementary of principles that in warfare one should fully appreciate, if not over-appreciate, the capabilities of his adversary. And indeed when this Administration is arguing for defense expenditures it seems to follow that tenet with some zeal in its depiction of Soviet military capabilities. And yet when this same Administration argues for economic warfare it persists in underestimating its adversary. The economic system is painted in incredibly simplified terms best described as a caricature of the actual Soviet economic system. Soviet leaders are depicted as having few, if any, options and the system is seen to be in dire straits. It is this caricature, rather than careful analysis, which allows policy makers to delude themselves that policies costly to the Atlantic Alliance also carry potentially high benefits.

It is time for the Reagan Administration to move beyond caricatures of the Soviet economy to an understanding of the far richer reality of the real system. The Soviet economy has a long history of economic difficulties, and an equally long history of economic successes. Throughout the last 20 years when Soviet specialists were carefully (and accurately) describing how cumbersome the system was, it still managed to produce real GNP, military spending, and consumption growth rates quite respectable by world standards. And while the decade ahead will hardly be a good one for the Soviet economy; that could be said of many countries. There is little the United States can do objectively to make the situation better or worse. And what we can do to make it worse may damage the Atlantic Alliance and push Soviet leaders away from the very policies we should like to see them pursue.

The CHAIRMAN. Thank you very much, Mr. Hewett, for your fine testimony.

Senator Mathias, you have not had a chance to question the panel this morning. So why don't you start out?

Senator MATHIAS. Thank you, Mr. Chairman.

First I want to express my appreciation to all of the panelists, because I cannot think of a more important subject for this committee to be addressing or a more important subject for the American people to be thinking about than both the philosophical basis and the practical expression of our attitudes toward the Soviet Union. It is the most important international relationship of all time, because there have never been two nations which commanded the power which the United States and the Soviet Union command today.

So this is a subject that needs to be thought about, and is obviously not thought about enough, as the witnesses this morning have very clearly demonstrated. Actions are taken without regard to whether or not they will obtain any reasonable, practical, or rational objective. So we do have to think about what our objectives are, and then we have to develop policies which will promote the attainment of those objectives.

Mr. Jenkins spoke about Soviet dependency on hard currency. I have been intrigued with the position of the administration, which is supported by some thoughtful economists, that the grain sales will consume Soviet hard currency, while they make the difference that the pipeline will generate hard currency and therefore that there is a rational distinction between the administration policies on these two different subjects.

Mr. JENKINS. I agree, Senator, but I think it is important that we recognize that, whereas our grain embargo initially might have had some effect, the fungibility of the grain market eventually rendered the embargo impotent. But from the very beginning, an effort to interdict the pipeline was doomed to failure. The extraordinary reaction of our allies to the June 18 announcement was really entirely predictable.

Foreign currency will be generated by that pipeline, because the Europeans do not share our Government's assessment of the dangers of that result. They point to the development of a hard currency flow as the creation of a Soviet dependence. I happen to agree with that.

Senator MATHIAS. Does this distinction between two projects, one which will consume hard currency and one which will generate hard currency, create a valid basis for us to take such differing views on these two projects, one that we will go forward with selling grain because that is really hurting the Russians—I mean, nobody has quite come out and said that, but that is the underlying thesis, that we will hurt them by selling them grain because we will take their hard currency away from them, whereas the Europeans are conferring a great boon, a kind of gift, by giving them the ability to generate hard currency?

Mr. JENKINS. The Europeans feel that the availability of another important energy source of supply is a gift to Europe in a sense. It is a benefit. Gift is the wrong word.

Senator MATHIAS. Of course, that is very seldom mentioned in this.

Mr. JENKINS. I think it is up to the Europeans, since they are the consumer of the product and to a large extent the builder of the pipeline. We attempt to impose our standards or the standards of this administration and deny the Soviets Caterpillar pipelayers, so they switch to Japanese pipelayers; not an effective exercise of U.S. policy.

It comes back to the question of effectiveness, which I think both of you have mentioned in your opening comments.

Senator MATHIAS. Mr. Hewett, would you care to comment?

Mr. HEWETT. Senator Mathias, I have always been astounded that the administration could give that argument with a straight face, and I doubt if there are too many respectable economists who really buy it. If this game is about imposing costs on the Soviet Union, the greatest cost we could impose on the Soviet Union among all the possibilities would be to prevent them from acquiring any grain on world markets. At that point, if they wanted to feed people they would have to divert a tremendous amount of resources from elsewhere and come out in international markets to buy some of the capital necessary to beef up Soviet agriculture. It would be far more costly than any possibilities we have on the pipeline.

That argument is not a valid one. The political argument, our inability to construct an embargo, is a valid argument, but a much different one.

Senator MATHIAS. Dr. Wolf, I think it looked as though you wanted to make a comment on that.

Mr. WOLF. Yes. Let me do so, because perhaps it will leaven these proceedings with some disagreement, because we all seem to be in such splendid harmony. I think this notion of effectiveness as the touchstone of policies, be they grain embargoes levied or not levied or embargoing the GE compressors, sounds good at first hearing. But when one looks into it I think it is a snare and a delusion, because what it leads to is the suggestion that unless a particular means of imposing marginal additions to the problems, constraints, and impedances that the Soviet decisionmakers face has a dramatic effect, it is ineffective.

The point I was trying to get across is that both the grain embargo and an embargo on the GE compressor technology have some effect imposing costs. In the grain case, the costs would come from shifting, as the Soviets did in 1979-80, to alternative sources of supply, and there have been some estimates of what the incremental costs that they incurred from those shifts in trade patterns were.

In the case of the pipeline, the costs would ensue from either the reduced throughput of natural gas and a reduction in hard currency earnings, which probably would be very small and indeed could be circumvented by having a larger number of lower power compressor stations, which would raise the investment cost of the project but would sustain the throughput.

In each case, there is a similarity rather than a difference, because they impose costs. Now, there is a question of what the cost-benefit ratio is, and my feeling about both of them is that there should be no subsidies on either the pipeline nor on grain transactions. And the plain fact of the matter is I think there is nobody in the West, including President Mitterand and Chancellor Schmidt, who knows the bottom line of the Yamal pipeline. The agreements are secret and proprietary and extremely complex, involving multiple governments, multiple banks, multiple suppliers, and multiple distributors.

There is no one who knows whether the Yamal pipeline is a ripoff by the Russians or a benefit to the West. I think the extent to which the details of the agreement have been secret is not reassuring in terms of what that hypothetical bottom line of the agreements actually amounts to.

Senator **Mathias**. I want to be sure that I understand what Dr. Wolf is saying. Let me lay my own bias on the table and say that I was against President Carter's action in imposing the grain embargo and I was against President Reagan's action in lifting the grain embargo, which is somewhat paradoxical, but nonetheless it is the way that I felt about it.

But if you go back to the Carter imposition of the grain embargo, are you suggesting, Dr. Wolf, that, notwithstanding the costs, an action of that sort can send a message?

Mr. **Wolf**. I think in both cases, with respect to the invasion of Afghanistan in 1979 and the repression of solidarity and the imposition of martial law and the failure to make any relief of that repression, there is a signal, there is a message, and I think it amounts to more than what has been referred to by Senator Tsongas, as "making us feel good." I think there is some importance in demonstrating resolve and seriousness of purpose. The symbolism does matter.

Senator **Mathias**. But would you carry that as far as Mr. Jenkins' example of cutting down the Aeroflot flights from three to two a week? I mean, that is a symbolic act, but is that carrying it to the point of being just ridiculous?

Mr. **Wolf**. I think it is getting close, because I think the extent of the symbolism and the strength of the signal depend on the imposition of costs to the Soviet economy and also on the willingness of the United States to incur costs of its own.

Senator **Mathias**. Then I think we reach a point on which we probably all do agree, which is you have to understand what is really going to impose costs on the economy that you want to affect, on the nation that you want to affect. So you have to have some understanding of what the practical effect is going to be.

Mr. **Wolf**. That is quite correct. I fully agree with that, Senator Mathias.

With respect to the symbolism and the transmission of a signal, I think it is important to understand the costs to ourselves and, in an ironic sense, the bigger the cost to ourselves the stronger the signal we transmit.

Mr. **Jenkins**. Senator, may I interject something? I am intrigued by this line of reasoning, and I do not disagree with it. But I think to understand how symbols are received by our target is terribly important. In an administration, such as the Carter administration, which lurched forward on a grain embargo but refused to take the steps which would in my judgment send a lot stronger signal—to rebuild our military capabilities, to consider announcing registration and not get all tangled up over whether it is to include women as well as men, would have been a much more significant signal to a military action by the Soviet Union.

I think this is what the businessmen in those briefings at the White House were saying. To single out in isolation a seemingly easily available economic lever and not have the courage to bite the bullet in terms of the long-range military balance of power would be read by the Soviets, on the basis of my 20 years of experience in dealing with them, as a signal of weakness and not strength.

Senator **Mathias**. I see that the chairman is sending me a signal with the red light.

The **Chairman**. Well, there are only two of us here, so go right ahead.

Senator **Mathias**. Do you have some questions at this point?

The **Chairman**. If you would like to finish yours, I will be staying on until the end anyway.

Senator **Mathias**. I will come back.

The **Chairman**. Why do you not continue.

Senator **Mathias**. All right. Thank you very much, Mr. Chairman.

I would address this question to the panel at large. What tools would you recommend the U.S. Government use in trying to influence the policies of the Soviet Union? That on its face is a difficult task. It is difficult because we know so little about low Soviet policy is formulated in the first place: Who are the real movers and shakers responsible for formulating policy? If you do not know who is making policy or how they make it, it is hard to determine how you are going to influence it.

What would you suggest we ought to do?

Mr. **Hewett**. I would first of all reiterate something that I have said in my testimony, and that is that I think one of the best tools that we have, which is virtually not used in the formulation of our policy, is careful analysis of the Soviet economy and the Soviet political system.

Senator MATHIAS. That is not something that politicians are generally very quick to do, to sit down like that. It is much easier to make speeches.

Mr. HEWETT. And it is something that academics may be overly prone to do. So maybe we should compromise.

I think, from my knowledge, for example, of work that is going on in the U.S. Government, it is not that some of this careful analysis is not done. We have some of the best work being done on the Soviet economy right now in the CIA in the Office of Soviet Analysis. And I must say that if we had listened to them, for example on the pipeline issue, I do not think that we would be in the mess that we are in right now, although obviously I was not privy to much of the advice that they were giving.

Second, I would like to see us use diplomacy and diplomacy with our allies much more carefully. We must consult with our allies to understand where their preferences and understandings are regarding the Soviet Union. And if we are wildly at variance with them, then we must first talk to them about it and then set policy concerning the Soviet economy, instead of doing it the other way around.

We are in the ludicrous position right now of taking sanctions, threatening sanctions against Western Europe in order to convince them not to get into a deal where the Soviet Union might take sanctions against them 5 to 10 years from now. That irony has not passed them by and certainly has not passed me by.

Finally, obviously we do have a need to maintain a strong military posture vis-a-vis the Soviet Union, and probably in the seventies we did make some mistakes in that regard, or at least some mistakes that had been made in an earlier period were coming to fruition. That would be last on my list.

Well, no. Last on my list would be embargoes, and I doubt if I would ever get to number four, because I really do not think they work very well.

Senator MATHIAS. Let me follow up your last statement. Is it possible to say that embargoes don't work very well, or do you think that situations might exist in which an embargo would be a useful instrument of national policy in trying to influence another nation?

Mr. HEWETT. Senator Mathias, I find it very difficult to conceive of a situation where, when a great power such as the United States openly undertakes an embargo policy, that that is going to cause another great nation to change a foreign policy in an area of fundamental interest to it. Or, in fact, in an area not even of fundamental interest to it.

If you think of the history of economic sanctions taken against countries in recent years, countries far weaker than the Soviet Union have really not only not caved in to the sanctions, but many times have worked very hard to get around them. And it has stimulated them to do things they have not done otherwise.

Rhodesia has done rather well under a very long period of sanctions. Of course, part of the lesson of Rhodesia is it is hard to get people to agree to and enforce sanctions. But in the Soviet case where you are dealing with one of the most powerful economies in the world producing 11 percent of the world's GNP and half of the GNP of the United States and very well endowed in natural resources, rather intent upon using those resources to realize its own ends, it is virtually impossible for us to influence them through an embargo except in a perverse way. That is, we may force them to do things that they could not otherwise do, even if they were in their own interest.

Mr. **JENKINS**. Senator, I agree with that. I would like to underline one aspect of it. Earlier this morning, Senator Glenn and Professor Treml engaged in a colloquy about short supply points in the Soviet economy. And it brought to my mind the reality that most technology today is fungible. If we have it and the French do not have it, it is probably because we got there first, nailed the market down, and it is not worth their while to invest—to develop that technology because we will already be out in front.

If we withhold our monopoly products—so-called monopoly products—we immediately create a market incentive for our competitors. We have seen this time and time again. The United States, and specifically Armco, my present employer, was a prime producer in the world of submersible pumps.

Senator **MATHIAS**. It is a splendid company with excellent facilities in Baltimore, Maryland.

Mr. **JENKINS**. Thank you, sir. They had almost a proprietary market position in submersible pumps. When the Carter administration first made it difficult and then blocked the sale of submersible pumps to the Soviet Union, the French made the investment which they had not chosen to make before, and they are now a prime competitor of ours. And thanks to their more liberal Exim bank funding, they are taking over marketplaces from us, with a technology that they developed because of this market incentive which was created by this very shortsighted embargo policy.

We could harrass the Soviet economy if we could achieve an embargo policy agreed upon by most of our allies. We have never been able to do it and I don't think we ever will be able to. But we cannot have a strategic effect on the Soviet economy by such a policy.

Senator **MATHIAS**. Dr. Wolf?

Mr. **WOLF**. If I could make one comment which I think is implicit in my earlier statement, and it relates to Mr. Jenkins' point about a strategic effect on the Soviet economy and Soviet behavior.

If you look at the size of the import surplus accumulated by the Soviet economy, according to Dr. Treml's meticulous and exhaustive study; that is, the excess of imports over exports, evaluated in Soviet domestic prices, sustained in 1978—that was the last year for which the full data were available—it approximates something like 10 percent of the net material product of the Soviet Union.

It is much smaller when evaluated in foreign trade prices, than when evaluated by Soviet domestic prices. The latter do not reflect rational prices, or opportunity cost prices, but they reflect planners' choices.

The ruble value of this import surplus in domestic prices is thus a major source of revenue—in effect, it is a tax—for the Soviet state. The means of financing import surpluses is by external credits.

The $80 billion-plus accumulated debt to Eastern Europe and Soviet Union—and there is at least some fungibility between debt to Eastern Europe and relief of burdens by the Soviet Union for its client states in Eastern Europe—seems to me to be utter folly from a strategic point of view. It simply endows the Soviet Union with additional resources, which is what an import surplus does, with which to resolve the inherent contradictions and conflicts in its economic system.

For the West to ease the conflict between resources allocated between consumption, military spending, and the costs of its overseas empire, seems to me a strategic blunder whose magnitude is far greater than what may be involved in the embargo.

I think there is a tendency to focus on a minor point, namely, the compressor technology and whether it is worth transmitting that signal to the Soviet Union over how much we are concerned about martial law in Poland, while omitting and ignoring a major strategic blunder by the West; and that is, providing additional resources with which the Soviet economy and its interest can be advanced.

Mr. **Hewett**. Senator, may I comment on that?

Senator **Mathias**. Yes. I want to yield back to the chairman, but please go ahead and comment at this point.

Mr. **Hewett**. I disagree with some of what Dr. Wolf said. I think that we should try to clarify some of these issues.

First of all, the large deficit in Soviet foreign trade in domestic prices reflects in great measure the fact that the Soviets underpriced oil until January of 1982, and oil was a major export. After the 1982 price change that deficit will be much smaller. So in a way, it is an illusion. And that is one of the reasons that some of us have objected to simply using Mr. Treml's figures in discussing Soviet dependence on foreign trade. And I doubt that Professor Treml would disagree with me.

Second, if you look at the 1970's and the Soviet economy's participation in international trade, net debt—nor gross debt—net dollar debt for the Soviet Union from the world's banks increased by under $10 billion, and at the end of the 1970's was about $10; having been a couple billion dollars at the beginning of the decade. The gross debt at the end of the 1970's was $17, but they had about $7 billion in deposits in Western banks and in some East European banks.

Over that same period that they borrowed—let's for round figures say—$10 billion, I have calculated that they received windfall gains from gold price increases and oil price increases of about $25 billion. That was the major influx of resources that allowed them in the latter part of the 1970's to buy huge amounts of grain, large amounts of technology, and to avoid some of the problems that were being imposed upon them by their own inefficiency.

I say this to emphasize that even short-term fluctuations in the Soviet economy, to a large extent, are a function not of things we do but to things out of our control. And if I were a Soviet leader, I would be more worried about forecasting gold prices or oil prices next year than worrying about whether Mr. Buckley is in Europe working on credit restrictions.

Mr. Wolf does make a good point in saying that it does not make sense to provide subsidized credit to the Soviet Union in order to assist them in developing their gas industry, and the first people we need to be talking to about that are probably the French. We need to be discussing that in Europe.

And hopefully, there will be one good thing come out of this episode we are going through, which I hope ends very soon, is that we will sit down with our allies and talk about credits. But if we alone decide not to give subsidized credits to the Soviet Union, which in effect we have done for a number of years, it will have virtually no effect. We need to talk to our allies about it, and that is a legitimate point for discussion.

Mr. JENKINS. And I might add that before his unexpected sudden departure from the Cabinet, Secretary Haig was, in fact, working very hard precisely on that point. I think he felt that he had a deal with the President and that, in fact, the administration was going to adopt the policy of concentrating its efforts with the Europeans on the development of a common finance subsidy credit policy, and abandon efforts to impose our unilaterally held position on the development of the pipeline.

I regret the fact that Secretary Haig lost on that issue. And I was stunned by the President's decision, as I think most of us who were fairly close to the process, were.

Senator MATHIAS. Certainly, it looked as though it were moving in the other direction.

Mr. JENKINS. Yes. The other way.

Senator MATHIAS. Thank you, Mr. Chairman.

The CHAIRMAN. Thank you, Senator Mathias. Just a followup, let me be sure that I understand your attitude on one point that Senator Mathias raised. Is, in your judgment, Soviet growth significantly constrained by the lack of foreign exchange? Just a yes or no would be adequate.

Mr. WOLF. Yes.

Mr. JENKINS. Yes, I agree with that.

Mr. HEWETT. Not as much as those two think. [Laughter.]

But it is a yes. I will give you a two-handed yes, on the one hand and on the other hand.

The CHAIRMAN. If, for instance, the pipeline goes through and stays on schedule and revenues are as anticipated and it does add significantly to their economy, how much of that extra that they get will they really be forced to spend on such things as grain, anyway, which is a consummable, which certainly strengthens our economy if we don't have to buy it in surplus and store it at a cost to the Treasury and just sell it for hard currency.

Mr. JENKINS. Senator, I think it is important to recognize that the shift of Soviet hard currency earning which will take place in the next decade is, in fact, a result of their beginning to lose their capacity to sell oil in the international market. They will begin to fill that gap by the sales of gas.

The net effect of this shift from oil to gas is probably—at least, most projections I have seen—pretty close to a wash. That they will not have an enhanced capacity to purchase abroad as a result of the gas line. They will simply maintain their present capacity.

Mr. HEWETT. Senator Percy, if I may interject, I think they will be lucky if it is a wash.

Mr. JENKINS. I agree with you.

Mr. HEWETT. The reason I am giving you a one hand/other hand answer is that I think we have overdone our interpretation of the constraints on the Soviet economy from foreign exchange in the 1970's because of what I talked about, the windfall gains. In the 1980's everything that worked for them in the 1970's seems to be working against them. Oil exports will fall, oil prices are falling, gold prices are falling, interest rates will be high and credit will be much harder to obtain.

For all those reasons, they will most definitely be constrained on foreign currency in the 1980's, and all those gas earnings will be much needed and will not be regarded as anywhere near the luxury some of them were in the 1970's, or the surprise.

The CHAIRMAN. Will part of that revenue go actually to paying down some of their debts?

Mr. HEWETT. If all the pipeline expenditures run out, as I have estimated, say, at about $25 billion by 1985, in just principal and interest, the first few years will be running them about $3½ billion, and that is for all pipeline expansion and not just the pipeline.

The CHAIRMAN. Mr. Jenkins, in your prepared testimony, you implied that with respect to other European allies we have taken a "let's teach them," attitude. This "be a leader" attitude seems to have brought disarray and weakened our Western alliance.

As I recall this series of incidents that occurred at the beginning of the Polish situation, we did really consult with our allies. There was a feeling that if Soviet forces moved in, there would be total unity. I know that in the meetings I had in November 1980 with the leaders in the Kremlin, I mentioned to Brezhnev—just the night before I left, Chancellor Schmidt had told me that if they moved in with force, it would unify Europe like it has never been unified, our alliance would be unified and it would change the face of the globe.

We were prepared then. What happened—he said they did the same thing, the same kind of question, but I was rather surprised that the Polish military itself responded and actually turned guns against the Polish people, which I had really not anticipated.

From your background, had any of us anticipated, was there any reason to anticipate that that would be the way it would be done and could be done? Same end results, but done in such a way that it found us not prepared to respond.

Mr. JENKINS. I am sure there is a voice out there in the wilderness somewhere who is saying: "If you had only listened to me." But I haven't heard him. I found within the administration and in the academic and professional community outside the administration total surprise by the capacity of the Soviet Union to do this. If you look back at post-World War II period, it is something of a watershed, and somewhat alarming.

We have always assumed that the forces within Eastern Europe would constantly boil up, as they did in 1953, 1954, 1956, and 1968, and again in Poland today, and that each time, the Soviet Union would be forced to intervene with its own forces.

The Polish situation is the first time in history the Soviets have accomplished their objectives relying totally on native forces. And that is not very encouraging to me, as one who believes very strongly in the importance of accelerating more freedom, more independence in Eastern European countries. I don't think anybody was ready for it. I think it did bring about a crisis internally within our alliance. I am extremely critical of this administration for, at that point, not going back to the consultation process to arrive at a common policy of how to respond to a new challenge. That is where I think we made our mistake.

The CHAIRMAN. I think you all agree on one aspect, and on that same page you mentioned that the Soviet Union should pay the true economic price of trade, and Dr. Wolf, in his prepared testimony, mentioned that all subsidies should be removed. I concur with that, and have written to every European power saying this aspect of the Reagan policy is absolutely right. And I think we would find a strong opinion in the Congress on that, that they should not subsidize concessional credit terms. They are not a developing nation; they are a developed country. They ought to pay the full going market price. We all concur with that.

How do we handle that, though, when within the alliance, one country may feel well, they can't compete on the end product as effectively as, say, certain other allies can. Therefore, in order to get the business, they have to do it through concession on trade; on credit, for instance. And so, we have within ourselves divided objectives.

Their objective is to keep their people employed in each of these countries. How do we cope with that problem, when they say, we can't get the business otherwise, and we have to go after that, and therefore, we make these concessional loans as part of our deal, as part of our bid to get the business?

Mr. JENKINS. Mr. Chairman, because I have been so involved in our steel war with the Europeans in the last few weeks, it has come home to me that our relationship with Europe is just as interdependent as our relationship with the Soviet Union.

We cannot divorce our export-import policies and problems or pipeline policies from our steel market problems and our agricultural market problems, and it is clear, to me at any rate, that if we are to achieve any unity within the alliance on financing and credits, we are going to have to give it a sufficiently high priority to be willing to pay a price in some other sector of our economic relationship with them.

You are quite right. The French cannot compete with us on many of these products, and they compensate for that by, in a sense, underwriting it through government credits. So it is a "CETA program" for the French worker, and it is very damaging politically, in my judgment.

The CHAIRMAN. Dr. Wolf, would you comment?

Mr. WOLF. Yes. It is a CETA program for some French workers, and it is an extraction from the French taxpayers as a whole. It seems to me the two points that you raised about subsidized credits and subsidized prices on export supplies are related, I think we should consult fully with our allies on both issues, but the chance of getting a serious agreement from them is about like Krushchev's metaphor of shrimps learning to whistle.

President Mitterand's and Chancellor Schmidt's disavowal 5 or 6 days after Versailles of the agreement that was arrived at for exercising restraint and prudent judgment in the extension of credit, is an example of that.

However, on the matter of concessional credits, I think the international capital market will take care of that. To the extent that foreign banks have in their portfolios large quantities of Eastern European and Soviet paper, the attractiveness of those banks to holders of petrodollars and to other investors is going to diminish.

As far as subsidized prices on pipe and steel and so on, I think those points should be publicized in the electorates of our allies. They are democracies; they have voters, the taxpayers are, in general, shouldering a burden that certain influential parts of the French and German economies are extracting from them. I think that is as far as we can go, and I don't think there is anything useful to be gained by holding out the prospect that we are going to get agreement from the French and the Germans.

**The Chairman.** Thank you very much. Mr. Hewett, you mentioned in your statement that despite the fact that the Soviets have an economy half ours—of $1.4 trillion—with a larger population, and they are rich in resources yet cannot seem to deliver the goods, despite this they have a huge military establishment that is at least on parity with ours. Some even in the Pentagon have testified that aspects of it are superior to ours.

How do you account for this capability on the one side, the military capability, as against the seeming incapacity of the system to deliver in the consumer area?

**Mr. Hewett.** I would say to a certain extent, the two are interrelated. The Soviets have made a strategic decision to set aside the military as a system from the rest of the economy, to give it literally unconstrained ability to acquire resources—human resources, fiscal resources, research and development resources—and to turn those into a productive capacity which then can produce military goods sufficient to provide the Soviet Union with the military power we see today.

One of the striking differences between the way they have organized that sector and the rest of the economy is only in that sector, to my knowledge, is the consumer the ultimate determinant of what will be produced, what quality will be embodied in the products, and when those products will be, for example, rejected because they are not sufficiently high quality. Nowhere else in the Soviet economy is that true.

So I would say that in part, because they have done that, they are starving the rest of the system of resources, of research and development, of investment resources, of human resources.

I remember once a discussion with an East European friend of mine about whether or not a room I was in was bugged. He said, No, we don't even have the technology to have phones work. My argument, which actually gave him some pause, was, it is because that technology is in the military that you don't have the technology.

The CHAIRMAN. Mr. Jenkins, you mentioned the problem of alcoholism, evidence of which I have seen. Is there a relationship between this starving of the society on the one side, the deprivation and drabness of life there, and perhaps the resort to alcoholism as a direct result or response to it?

Mr. JENKINS. I think the response to that is yes, Mr. Chairman. There is another aspect of it which I found rather intriguing, and to which I came only after living there for 2 years. And that is the question of privacy. One of the great shortcomings in Soviet society is the absence of privacy. They still live 8, 10 or 12 people per toilet. You can imagine the traffic jams in the morning.

It is difficult for a Soviet worker, when he goes home after a long day, to find the time when he can sit down and unwind, either together with his wife or just alone. One method—and I have had a lot of people much more profoundly trained in this than I am—of creating a sense of privacy is to get drunk, and in that sense, develop an internal privacy.

I think that that explains a great deal. Developing privacy is capital intensive. Housing is one of the most capital-intensive industries. They have starved the housing industry consistently since communism came to power in the Soviet Union.

The CHAIRMAN. I have one remaining question which I will put to each of you for a brief answer.

Certainly, there seems to be no disagreement that any effort by us alone to change or alter the behavior of the Soviets by economic sanctions is doomed to defeat. It is just a dismal effort, a feeble effort on our part and has no real impact over there, and causes them to be alined more with our allies.

Is there any chance, in your judgment, of causing our major allies who do have a greater political and economic stake in trade with the U.S.S.R., to somehow develop a more cohesive, multilateral trade policy? Do you see any future in that at all, or is it an effort that we should abandon? Is it worth trying to develop at all, or is it just doomed to defeat before we start, based on what evidence we have seen so far in our efforts?

Mr. JENKINS. I think Dr. Wolf probably does not agree entirely with your consensus statement, so why don't we let him go first?

Mr. WOLF. Mr. Chairman, I would just like to have the record show that while I do not necessarily subscribe to the way in which the embargo on GE compressor technology was imposed, I think that a general strategy of restricting resource flows to the Soviet Union and Eastern Europe ought to be one to which we give more attention than we have. And this is one small example of applying such restrictions.

I do not think the best way of doing that is through an embargo, but it is one way.

On the question of developing a multilateral trade policy, a free and more open trade policy with our allies with lower tariffs and nontariff barriers to trade and to reduced subsidies of the pervasive sort that I referred to, I think that is an eminently worthwhile effort to engage in, and it is important to sustain those discussions within the alliance.

I would not be any more optimistic about their success than I would be about the prospect of any single economic measure bringing the Soviet economy to its knees.

Mr. **Jenkins**. I think I agree with that, Senator. My feeling is that a more cohesive trade policy may be difficult to achieve. It may be unachievable, but we must pursue it. And the failure of that pursuit creates problems which would far outweigh anything that the absence of a cohesive policy would generate.

I don't want to miss this opportunity to add one brief point, sir. I am sure you have already noted it, but I would like to hail President Reagan's statements in Iowa last week regarding the sanctity of contracts with the Soviet Union. Hopefully, he will recognize that what is good for Iowa farmers is also essential for Illinois pipelayers and harvest producers, and their thousands of workers and shareholders as well as throughout the rest of the country.

Consistency in his approach to this would be a great boon, I think.

The **Chairman**. The group that I took to the White House in the meeting chaired by Judge Clark, certainly had no compulsion about saying that this is adversely affecting our business all over the world. This included the chairman of the board of Caterpillar. We just look like we are unreliable suppliers.

Any country that might have a political difference with us could possibly end up having an American product for which they could not buy spare parts if some difference of opinion politically arose. They say they have evidence that it has hurt them all over, just as the Carter embargo on grain hurt our sales significantly and permanently, as has been pointed out in excellent testimony today.

When the void is there, Argentina moved in and developed its productive capacity. Then it has to compete heavily to get those markets. That is what is keeping prices depressed and farmer income at a very low level today.

Well, we have a tough problem. Certainly, I have the competing forces in my State. We have all the farmers who want the business. You have the manufacturers who need the trade, but you have also the largest Polish-American population there which is deeply concerned about what is happening in Poland.

I addressed the American-Polish Congress when they were here last week and told them that I am sympathetic with them. That I would do anything I could to relieve the conditions in Poland. But what good does it do if what we do is not effective and has no material change in attitude? Then we are really hurting ourselves and not bringing about a change in policy.

Your testimony has been extradordinarily helpful and stimulating to us. I am going to package up some of the testimony and send it to some of the experts in this field who would be interested in following this before printed copies of this are available. I do think it is extremely important, and I want to thank you very much.

Senator Mathias, if you have additional questions, I wonder if you would mind taking the Chair.

Senator **Mathias**. I do not want to delay the panel, which has been very patient and very helpful. But I do have one or two other points.

The CHAIRMAN. Thank you for staying on and presiding in my absence.

Senator MATHIAS [presiding]. I will be very brief. Dr. Wolf, in your statement you note that what you call economic détente was a failure in influencing Soviet policy. I suppose we could all agree that it did not move the Soviet Union in the direction or to the degree that we wanted it to. We are unaware, however, of what they might have done in the absence of that policy, isn't that true?

Mr. WOLF. Of course. This is not a case where you can conduct a controlled experiment. But I think that my reading of the record is that those who were most voluble and eloquent in espousing the gains in behavioral terms that would ensue from substantially increased economic transactions and credit and trade and so on, painted a quite different picture from what actually ensued in Afghanistan in 1979 and Poland in 1981.

Senator MATHIAS. I suppose my underlying question to you is this. Is part of the problem that we did not enunciate in a very clear way what we wanted them to do? Let me appeal to Mr. Hewett to refresh my memory, because he was here the other day, I believe, when Jim Buckley and Lionel Olmer were here, and I kept pressing them for a clear statement of what we wanted the Soviet Union to do in this pipeline business and they said well, it is all based on Poland, and they kept bringing up the President's statement on Poland as the justification for the pipeline sanctions.

I said, Do you mean if there is a dramatic improvement in conditions in Poland, that we are going to forget this whole business? They said, Well, may be it is not quite as simple as that. Well, then, what is it that you want the Soviet Union to do? Well, the President wants them to do something about Poland.

Now, is that part of the problem?

Mr. WOLF. If I could answer that, and I am sorry the chairman left because on this question of the use of Soviet force and the surprise that ensued when instead of a Soviet invasion the Polish military applied pressure in its place, it seems to me it is a mistake to look at the use of Soviet force only in direct terms. That is, invasion or not.

The notion that the threat, the real possibility of the Soviet invasion and what would ensue if that occurred, was a powerful stimulus to the intervention by the Polish military seems to me, on its face, to be entirely plausible. In that case, Soviet force was used, but it was used as a threat and it was used more adroitly than directly.

Second, there was envisaged in the discussions among the European and American Governments and bankers in the spring of 1981, something called the "tank clause." The "tank clause" did not involve reference only to tanks; it involved reference to the use of force in Poland as the trigger that would lead to a declaration of default and the cross-default provisions of the April 1980 agreement. That was the use of force in general; whether it was direct or indirect, Soviet or Polish.

I think our allies—and in this case, the administration—decided not to invoke that clause, but the prospect had been envisaged before. And I think we transmitted a negative signal to the Soviet Union in not acting as we said we would on the Polish debt issue.

Mr. **Jenkins**. Senator, if I could comment briefly on the détente question, I was part of Secretary Kissinger's staff at that time, and I think there is a serious misjustice going into the record here, in the sense that nobody in the administration, nobody who knew anything about Soviet affairs, expected an immediate or dramatic effect on Soviet international behavior to result from the fact that we were pursuing and initiating an economic relationship more or less proportional to those relationships which Western Europe had already developed.

Kissinger himself said, as I quoted in my statement, that we did not believe that trade itself would moderate Soviet conduct. Only that Soviet restraint would be more solidly based if reinforced by positive inducements, including East-West trade. The fact is we never had the substance of economic détente in place. The arbitrary, gratuitous interjection of Soviet emigration policy problems into the negotiations prevented that.

In 1974 in the Trade Act—in the late hours of December 30, New Year's Eve, Senator Byrd introduced an amendment to the Trade Act which forbade the use of any credits for fossil fuel projects. On top of that, we had the impact of the Jackson-Vanik amendment, and the Stevenson amendment, which robbed all of the substance of the carrot. We were left with a shambles in our efforts to develop a proportional economic relationship.

So whether or not it may have worked, there were no expectations that it would be more than marginal, and it never had a chance. I think it is important that we understand that. I am not offering it as a panacea for our problems with the Soviet Union, which are military, essentially and primarily.

Senator **Mathias**. Dr. Wolf is shaking his head. I think before we drop the gavel we need to give him a chance for a quick rebuttal.

Mr. **Wolf**. Well, let me repeat what I said before. I don't think either carrots or sticks are going substantially to influence Soviet behavior. But I think resource constraints that offer a smaller margin for the Soviets to resolve the complexities and conflicts and internal contradictions within the Soviet system can make Soviet decisionmakers think twice or three times, and will surface and expose these inherent contradictions. What economic détente, if you will, did instead was to ease those problems.

Now, I am under no illusions about the effects of embargoes or credit withholding on Soviet behavior, but at least it has an effect in reducing the resources available to and disposed of by the Soviet Union to pursue their preferences and policies. That is, I believe a move in the right direction.

Mr. **Hewett**. I don't see whether you have the gavel hidden down there, but if I might interject one final comment. I think you have touched on a very important point, and that is that our goals relating, for example, to this pipeline policy, are very difficult to discern. The official statement that it has to do simply with Poland is belied by the entire record of this administration's discussion of trade with the U.S.S.R., and discussion of the Soviet Union in general.

And I think really, one of the things that this administration should have done a long time ago was to think through what they wanted to have happen and what was reasonable. And it appears now, because they haven't had that discussion, there are different goals. In the President's mind, it is almost as if his long-term goal is for the Soviet Union to go away, as if somehow that could happen. And on the other hand, there are people in the administration who seem to have much more moderate goals, and I think that is one of the reasons the Europeans have such difficulty dealing with us on our policy toward the Soviet Union; because depending on who they talk to, they get much different messages about what we want.

Senator MATHIAS. I would say, if I were to take the record of the hearing we had the other day on the pipeline and try to explain to a Soviet visitor what message that had for him or for his government, I would be hard put. And not just because of my total incapacity in the Russian language. [Laughter.]

Mr. HEWETT. Imagine his problem, because he does have to explain it to his government.

Senator MATHIAS. I think this has been an extremely useful morning, and we appreciate the time that you have spent, not only here but in preparing for this meeting. And I am sure it will be a source of debate and discussion and dialog for those who read the record in the days ahead.

We thank you very much. The committee will stand adjourned, subject to the call of the Chair.

[Whereupon, at 1:16 p.m., the committee adjourned, to reconvene at 10:30 a.m., Friday, August 13, 1982.]

# ECONOMIC RELATIONS WITH THE SOVIET UNION

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FRIDAY, AUGUST 13, 1982

United States Senate,
Committee on Foreign Relations,
*Washington, D.C.*

The committee met, pursuant to notice, at 10:32 a.m., in room 4221, Dirksen Senate Office Building, Hon. Charles H. Percy (chairman of the committee) presiding.

Present: Senators Percy, Sarbanes, and Tsongas.

The Chairman. It is a great pleasure for me to welcome back so many good friends not only of this committee but of me personally and of other members of the committee.

This morning the Committee on Foreign Relations resumes hearings on U.S. economic policy toward the Soviet Union. Yesterday the committee heard witnesses on the topics of Soviet economic dependence on the West and Western economic leverage on Soviet policy.

Today we will hear panels of witnesses on two additional aspects of this set of issues: Implications of U.S. policy for our alliances and implications for the U.S. business community.

One of the major themes that emerged yesterday from witnesses and Senators alike was the importance of the effectiveness in whatever economic policy toward the Soviet Union we as a country undertake. I expect that this theme will be very much with us again today.

Our first panel today will address implications of U.S. economic policy toward the Soviet Union for our alliances with Europe and Japan. It represents impressive past government experience in the national security aspects of East-West trade. The Honorable Robert S. Ellsworth, now a private consultant, was Assistant and then Deputy Secretary of Defense from 1974 to 1977, having previously served as U.S. Ambassador to NATO in 1969 to 1971, and as a Member of Congress from 1961 to 1967.

The Honorable Myer Rashish was Under Secretary of State for Economic Affairs for the first year of the present administration. Richard N. Cooper, now professor of international economics at the Harvard Center for International Affairs, is also a former Under Secretary of State for Economic Affairs from 1977 to 1981, during the Carter administration.

Gentlemen, I again warmly welcome you. Let us begin with your testimony, which you can summarize in any way that you see fit. The full text of it will be incorporated in the record.

Mr. Ellsworth, why don't we begin with you?

## STATEMENT OF HON. ROBERT F. ELLSWORTH, PRESIDENT, ROBERT S. ELLSWORTH & CO., INC., WASHINGTON, D.C.

Mr. Ellsworth. Thank you, Mr. Chairman.

I will just summarize very briefly my statement. For years there have been strains between the United States and its allies on the subject of East-West trade. On the technical side, those strains have shown themselves over differences of treatment and approach to COCOM and on the commercial side have manifested themselves in competition over credit with regard to East-West trade.

Of course, the Soviet gas pipeline has highlighted and dramatized the issues between the allies in new ways and has brought to the surface the very different approaches and assumptions that we use in our approach to East-West trade.

At the same time, I argue that the pipeline issues may show the way toward the development of new policies that might permit us to shift the dynamics of the strategic dialog between ourselves and the Soviet Union. That is the burden of my views this morning before the committee. Let me just very quickly develop that theme.

I will start off with the subject of the European approach to the gas pipeline as I see it. First of all, although I am not an economist, I understand that the economics of the gas delivered to Western Europe are not as attractive now and do not seem likely to be as attractive in the future as the economics were when the pipeline was originally conceived.

But on political grounds rather then strictly on economic grounds, the Europeans have some rather pronounced views and have developed policies heavily influenced by political considerations as, of course, U.S. policy for years and years has been influenced by political considerations when it comes to our energy policy—decades, I would say.

On the political side, in the first place, the Europeans have emphasized the importance of having diverse sources of supply as far as their sense of energy security is concerned. In addition to that, as far as the pipeline is concerned, they see their participation in the construction of the pipeline as being an important element in the sustaining of their employment. Literally thousands of jobs, both directly and indirectly, are involved in manufacturing the pipeline and its associated equipment.

Third, in Western Europe and, most particularly, with the Federal Republic of Germany, there is a positive policy and strategy toward the East which also is reflected in this pipeline deal, a policy of developing, building up, and restoring ties—commercial ties, trade ties, cultural ties, all kinds of ties—as a possible first step in the restoration even of political bonds that were torn asunder at the end of the Second World War.

So all of those political considerations enter into their policy with regard to East-West trade and, most particularly, with regard to the pipeline.

The governments, by the way, have also very carefully calculated, when considering their vulnerability to Soviet pressure as a result of buying Soviet gas, the availability of alternative sources.

They have carefully calculated storage capacity and have carefully calculated a possible surge function in case of need at some time in the future. So the governments of Western Europe who are in the pipeline deal feel they have protected themselves and their people against that, to some extent, at least.

On the other hand, here in the United States, of course, we have felt subject to different political imperatives. In the first place, the President and his advisers have sensed, correctly, I think, that there would be and is a broad political support for their instincts with regard to it, and that is to pressure and punish the Soviet Union on account of the Polish situation in particular and also in order to try to limit the Soviets' abilities to spend money on their military buildup.

So that those political imperatives have I think, correctly governed our approach to the pipeline issue and, in addition to that, there is, again properly in my judgment, a deep concern about the fact that in a broad strategic sense the hard currency earnings that will insure to the benefit of the Soviets, when the payments start to flow for the pipeline, is something that the President and his advisers have been concerned with too, again properly.

However, looking at it objectively, even if all those arguments are correct, as I think they are, nevertheless the specific sanctions, it seems to me, that have been imposed and threatened are not very likely to be successful. I do not think they will stop the pipeline. I do not think they will stop the flow of currency, and I do not think the specific sanctions that have been threatened will help the situation in Poland—unfortunately.

So that under these conditions the European responses to the situation have been both practical and political. On the practical side, the firms that are involved are in a terrible box, as you know, Mr. Chairman, because they cannot win either way. They are going to suffer heavy financial penalties if these sanctions go into effect, if they obey the sanctions, and they will suffer heavy financial penalties if they do not.

On the political side, broadly speaking, the Europeans at a very deep level—and understandably so—feel as if their sovereignty has been infringed by the United States. In an alliance, particularly among, as it were, weaker members of the alliance, that is always a sensitive and delicate matter.

So in this extremely difficult atmosphere I am quite uncertain whether we can still dissuade the Europeans from participating in this present pipeline project. However, I think we may be able, with a new approach and a new initiative across a wide front, to work together with them and to dissuade them from participating in the next Soviet gas pipeline project, which will surely be proposed quickly, particularly if this one begins to bring in the benefits which the Soviets hope it will bring to them.

I think that the United States of America should try to work with our European allies and urge them to develop other sources of gas for the future for their energy needs, both in the north—in the North Sea—and to the south with Iran, with a number of other producers in the Middle East and North African area.

By the way, just as a footnote, I personally think that anything we could do to encourage the Europeans to do business with Iran would also benefit U.S. interests on a political basis throughout the whole gulf and Middle East area. That would be a side benefit.

Now beyond the resolution of the pipeline issues, it seems to me that there is a broader and a somewhat different issue, closely connected, and that is the issue of Western credits to Eastern Europeans, including the Soviet Union. It is linked to the pipeline issue because of the credits that are involved for the pipeline.

In my judgment, the ability of the West to provide very large-scale credits—and when I speak of the West, I include Japan—is a strategic commodity of the very highest value. If properly deployed, I believe we could substantially shift the dynamics of our dialog with the Soviet Union.

The decisive factor in the situation, of course, is the collapse of the ability of the Eastern Europeans and, first and foremost, the Poles, though not only the Poles, to sustain credit. As you know, Mr. Chairman, the situation is that they lack the ability to service their present debts. The only way in the world that they can service their present debt is by borrowing more from the Western banks or from somebody. The Western banks so far are the only ones who have indicated a willingness to lend to them or the capability to lend to them.

So what we have created is a situation overall in which the credits that we extend to the Soviet Union, to Poland, to Romania, to Hungary, and to Czechoslovakia are fungible within that empire, as it were. But the obligation to repay is separable and has been kept separate so that we have gotten ourselves into a trap, with the extension of credit to Eastern Europe, where we are paying all the costs and getting none of the benefits and we are not even proving anything at the present time by extending credits further to a bankrupt regime and probably to other bankrupt regimes.

So it is essential first that the Soviets be made to carry a large share of the burden of the credit for East European purchases from the West. Ultimately that would amount to requiring the Soviets to shoulder a larger portion of the costs of political stability, such as it may be, in the future in Eastern Europe.

There is a practical problem immediately because Western banks cannot force the Soviets to do that as they would have to declare Poland in default and the banks cannot risk that. However, Western governments could carry in some form the risks of loans to Eastern Europe and in turn those governments—our governments, Western governments—could require Soviet guarantees or Soviet participation in providing credit for East European trade with the West, and could require the Soviets to participate first and foremost in the restructuring of the Polish debt, its organization and structure.

Second, I would like to see as part of the overall approach Western governments being much more energetic at limiting Soviet and Eastern European access to technology that is related to military operations and, as part of that effort, there could be a much more vigorous campaign throughout the West against Soviet industrial and technological espionage.

So, Mr. Chairman, to sum up, it seems to me that there are three things that the West could do on a coordinated basis. The United States cannot do it unilaterally, but it could be done on a coordinated basis. First, forestall the next deal on Soviet gas to Western Europe by helping the Western Europeans go north and south and not east for their gas.

Second, draw the Soviets into a share of the burden for the economic stability of Eastern Europe and, third, limit the militarily useful and relevant trade between East and West.

Thank you, Mr. Chairman.

[Mr. Ellsworth's prepared statement follows:]

## Prepared Statement of Hon. Robert F. Ellsworth

### INTRODUCTION

East-West trade and credit policy issues have strained our relations with Europe and Japan, with more or less severity, for several years. This has been particularly apparent, on the technical side, in differences between ourselves and our allies in practical implementation of COCOM controls on trade with the Soviets and Eastern European countries. It has been apparent, on the commercial side, in the vigorous export credit competition that has existed among the allies for trade with the East.

The issue of participation in construction of the Soviet gas pipeline, and of European purchases of Soviet natural gas, has brought to the surface the quite different approaches and assumptions we and our allies bring to the question of East-West trade. But this most recent issue may also point the way to new trade and credit policies that might shift, to our advantage, the dynamics of the strategic dialogue between the United States and the Soviet Union.

### THE ALLIES AND U.S. POLICY ON THE SOVIET GAS PIPELINE

Objectively assessed, the Soviet gas pipeline project may not make much economic sense for the Europeans today, though at the time it was originally envisioned the economic arguments in its favor were doubtless more compelling. Since that time, projections of West European natural gas needs have steadily declined with the economic slowdown throughout the European Community and with the world oil price decline. For the time being, sufficient alternative sources of natural gas look likely to be available to Europe without importing Soviet supplies, and this should be true even if the development of Norway's gas fields takes place quite slowly. Moreover, the future price of Soviet gas is likely to be uneconomically high for European customers.

But on political grounds, rather than strictly economic arguments, the Europeans have stressed the importance for their sense of energy security of a variety of sources of gas supply. They have also emphasized the political importance of sustaining the employment—many tens of thousands of jobs in all—that participation in the Soviet gas pipeline project would provide. In reply to concerns, expressed both in Europe and in the United States, about the risks of dependence on Soviet gas, and the vulnerability to Soviet pressures that such a bargain might create, European governments have carefully calculated precisely what limits of dependence on Soviet supplies they believe would be tolerable. They have carefully spelled out what alternative sources, storage and surge capacity they could bring into play if Soviet supplies were for any reason curtailed.

Alongside diversification of supplies and preservation of employment, many governments in Western Europe—and especially the West German one—actively seek commercial and other ties with the Soviet Union and Eastern Europe in pursuit of a basically political strategy toward the East: to engage the Soviets in "normal" relationships with the West in the hope of constraining their behavior through a multiplicity of such ties. The European motive here is actually to restore traditional trade and cultural ties that formerly linked Europe East and West, as the first step toward restoring the political bond that has been broken since the Second World War. Without imagining that East-West trade or other links will in themselves create common political interests between East and West, one may nevertheless grant a certain legitimacy to European objectives.

But in the United States, the political imperatives have been different. The President and his advisors perceive broad political support for an approach that suits their own instincts as well: to pressure or punish the Soviet Union, not merely in view of the events that have taken place in Poland but also in order to try to change Soviet behavior in other areas and especially to try to restrict their spending on military capabilities.

The strategic impact of the pipeline project has also been viewed differently in the United States than in Europe: sales of Soviet natural gas to the West will provide the Soviets large sums in hard currency, which can be used in the service of a continuing military buildup. This is true even if it turns out that the pipeline will provide, in the long run, less hard currency than Soviet oil exports generate today.

But objectively speaking, even if these arguments against the pipeline are valid ones, as I believe they are, nevertheless the specific sanctions that the United States has now threatened are unlikely to prove effective. They will not stop the pipeline being built, nor will they prevent the Soviets from acquiring the hard currency sums it will produce.

Under these conditions, the European responses to United States sanctions (and by association the responses of Canada and Japan) include both practical and political elements. For European firms, the financial consequences of either complying with American restrictions or rejecting them could be extraordinarily severe. And Europeans generally feel sharp resentment of what they view as American unilateralism in imposing extraterritorial, retroactive embargoes on their products. The allies sense that American policy infringes their sovereignty, always a sensitive issue for weaker alliance partners.

In this difficult atmosphere, it is quite uncertain whether we can still dissuade the Europeans from participation in the current pipeline project. But we may still aim to dissuade them from the next such Soviet endeavor, which is certain to be proposed by the Soviets if the first pipeline begins to produce the rewards the Soviets so eagerly desire. In our dialogue with the Europeans about future energy cooperation with the Soviet Union, we might encourage more energetically, at an earlier stage, the development of North Sea natural gas fields. We should also certainly encourage looking more closely at the natural gas that could be provided by Iran and by a number of other oil products throughout the Middle East who are eager to find market for their gas in Europe.

## WESTERN CREDITS AND THE UNITED STATES-SOVIET STRATEGIC RELATIONSHIP

Beyond the resolution of our differences with the Europeans on the matter of the Soviet gas pipeline, the larger issue we should now address is how to collaborate with them—and with Canada and Japan—in a new venture: the creation of an effective strategy for making use of the immense leverage the West has at its disposal in relation to the Soviet Union as a result of our ability to provide large-scale credit. In a time of real credit shortage like the present, this is indeed a strategic commodity.

The decisive factor in the West's ability to exert leverage through its supply of credit to the East is a condition not fully acknowledged so far in much of the debate on East-West trade. That condition is the breakdown of Eastern European countries' capacity to sustain credit at anything approaching recent volumes, as evidenced by the situation in Poland, in Rumania, and even to some degree in the Soviet Union itself. Clearly, the present financial condition of Poland is untenable, but the only remedies at hand seem to be the provision of even more Western credit in the face of an evident failure of the capacity to repay debt or, on the other hand, the institution of an austerity program that is actually beyond the ability of the West to enforce.

What we in the West have created is a situation in which the credit that we make available to the Soviet Union for projects like the natural gas pipeline is entirely fungible—that is, it can be used by the Soviets for financing whatever projects they wish, including ultimately the expansion of their military capability—while at the same time the obligations of the Eastern European countries or the Soviet Union to repay debts to the West are not transferable in any corresponding fashion.

What strategy, then, should the West establish in order to shift the dynamics of the strategic dialogue, to exert effective leverage vis-a-vis the East?

First, it is essential that the Soviets be made to carry a fair share of the burden of credit for East European purchases from the West. Ultimately, this amounts to requiring the Soviets to shoulder a larger proportion of the costs of East European economic development, as they receive in turn the reward of a certain degree of political stability that may reasonably be expected to accompany successful development there. In this prescription, I share the views so well presented by Mr. Felix Rohatyn in his testimony on the Polish debt before the Senate Banking Committee last February.

At present, Western banks cannot force the Soviets to guarantee East European debts because the banks cannot risk provoking defaults in case the Soviets refuse to comply. But Western governments could carry, in some form, the risk of loans to

Eastern Europe and in turn those governments could require Soviet guarantees or Soviet participation in providing credit for East European trade with the West. As a signal of their firmness of purpose, Western governments might begin by a decision to declare Poland in default and to call on the Soviets to share "restructuring" the Polish debts.

Second, Western governments might cooperate more closely in an effort to limit Soviet access to Western technology with potential military value. One aspect of this effort might be a more vigorous campaign against Soviet technological and industial espionage throughtout the West and Japan. Another factor in gaining agreement on constraints on high technology transfers might be a more flexible Western approach to trade in other sectors, whether in steel pipes and turbines or in grain, on the basis of mutual economic advantage.

Such a strategy, in sum, would shift a reasonable portion of the political burden and the credit cost of East European economic reform and development to the Soviets, who properly bear it as long as their dominance is decisive in the region. But at the same time it would also engage the Soviets in a cooperative effort with Western governments to finance East-West trade in sectors where we and our allies both benefit.

The CHAIRMAN. Thank you very much. It must be good being over in the Senate after so many years in the House with the 1-minute rule.

Mr. ELLSWORTH. It is a great pleasure.

The CHAIRMAN. We will, by the way, use our lights to give you a little guidance on time. If you can summarize in about 10 minutes, that will be helpful, but if you spill over a little it will not matter. But we will run the lights for 10 minutes.

Professor Cooper, we are delighted to have you back with us.

## STATEMENT OF HON. RICHARD N. COOPER, MAURITS C. BOAS PROFESSOR OF INTERNATIONAL ECONOMICS, CENTER FOR INTERNATIONAL AFFAIRS, HARVARD UNIVERSITY, CAMBRIDGE, MASS.

Mr. COOPER. Thank you, Mr. Chairman. I have prepared a statement and with your permission I will submit that for the record and will summarize it briefly.

I distinguish among three purposes of economic embargoes or economic sanctions or, more modestly, economic restrictions. The first purpose is to try to get the object of the restrictions to reverse some course of behavior that it embarked on. The second is to accept that such reversal is unlikely but to signal symbolically that the countries imposing the restrictions disapprove of the behavior. The third is to influence the long-term economic and possibly military evolution of the object of the sanctions.

As to the first purpose, the use of sanctions throughout history has been notoriously ineffective. It is hard to find an example where the imposition of sanctions induced a reversal of the behavior which gave rise to the introduction of sanctions. On the contrary, more often than not it tends to mobilize support around the government within the sanctioned country.

The second purpose—the symbolic role—is important, but to have high symbolic value the sanctions or the restrictions need to be swift and they need to command wide support. Even if those two conditions are met, the symbolic value tends to erode over time. Moreover, this use of sanctions carries the risk that when they are reversed that action takes on the opposite symbolic value—approval—even when that is not intended.

So while there are occasions where sanctions or restrictions are politically important for their symbolic value, there are problems with it.

The third purppose to which trade restrictions or embargoes might be put is to influence the long-term evolution of another country. Their effectiveness depends on getting all of the potential sources of supply to participate in the restrictions.

Now on all of these issues there is, I think, deep philosophical disagreement between the United States and our allies and particularly our European allies. For reasons which are complex, Americans throughout history have been relatively quick to move to economic sanctions for one or another of these three reasons, whereas the Europeans have been loathe to move to economic restrictions. These are longstanding historical and philosophical differences, between the two sides of the Atlantic, not easily reconciled. That makes the use of restrictions by the United States for any of the purposes—symbolic, reversing behavior, or weakening the economy of the offending nation—the more difficult.

The one area in which there is agreement between the Americans and the Europeans is the need to keep militarily relevant goods and technologies from being transferred to the Soviet Union or, more broadly, to the Eastern European countries. It is my view that we should and in principle could tighten up on strategic trade with the Soviet Union. The difficulty in getting European agreement on this issue is the European suspicion that the Americans have quite different purposes in mind, more far-reaching that just limiting the strategic capability of the Soviet Union. The ambivalance and the ambiguities in American motivation have, over the years, induced European hesitation to agree to tighter COCOM restrictions.

The situation in which we find ourselves today unfortunately involves more than these philosophical disagreements. The U.S. administration has attempted to impose its view of these matters on its European and Japanese and Canadian allies. That in turn raises two quite different questions from whether to use restrictions or not. First, how should one reconcile differences, even deep-seated differences, of opinion within an alliance. What is the mechanism for decisionmaking within an alliance among sovereign nations in which effectiveness depends on widespread participation.

Second, the narrower, more political/legal question of extraterritorial application of American law to our allies, a point that has long been a sensitive one, not just in the area of East-West trade, although it has come up in that area previously, but it is a sensitive one in other areas such as antitrust enforcement, securities enforcement, and so on.

It is interesting to note that the current British Government, which is perhaps closest to the administration in its view of the Soviet Union and how the West should respond to the Soviet Union, is the most vocally sensitive of all of our allies on the question of extraterritorial application of American law.

What I have said so far is quite general and applies in general to the use of restrictions, without particular reference to the Soviet pipeline. But, in addition, there are differences of views on that.

The Europeans take the position, as Bob Ellsworth has said, that the gas pipeline is a necessary and desirable diversification of their sources of energy supply, on the supposition that continued heavy dependence on the Middle East for energy represents a potential danger to the West European and Japanese economies because of the political instability in that area. While they would prefer to diversify in other directions, even a diversification toward the Soviet Union represents a mitigation of that heavy dependence on the Middle East. There have been some disagreements between the American administration and the Europeans on that point.

Finally, an academic and detached rendition of the positions of the American administration and the Europeans does not convey the sense of outrage by the Europeans at the highhanded way in which they have been treated. In this respect they get strong echoes of sympathy from both Canada and Japan. Canadians take the view that theirs was the first country to feel what it is like when the elephant rolls over and now the Europeans are feeling it as well. It reinforces their desire to reduce their reliance on American firms.

The Japanese are too polite to express their indignation openly and their extreme puzzlement at what they consider to be highly inconsistent behavior on the part of the United States. They are inclined to interpret the inclusion in U.S. restrictions of the offshore oil drilling ventures between Russia and Japan, which they also seek to diversify their highly uncertain sources of oil, as yet another expression of the anti-Japanese mood which they see building in the United States. It will spur, I fear, their already considerable efforts to establish their technological independence from American firms.

This sharp emotional reaction raises yet another set of issues not inherent in disagreements in judgment and circumstances among friendly and allied nations, namely the cohesion of the alliance itself. The Russians have the satisfaction of observing us doing far more damage to our own interests than we can possibly do to them through restrictions of trade.

What especially galls our allies is the intolerable inconsistency in the U.S. position that pipes help the Soviet Union but grain does not.

A sophisticated version that is now being used is that whereas gas is purchased from the Soviet Union, grain is sold and that uses up rather than provides foreign exchange. This version does not go down any easier. It represents a reversion toward the old mercantilist fallacy that money—in this case foreign exchange—helps an economy, but goods do not.

Grain, like machinery, helps the economy of the Soviet Union. The allies see the U.S. position as one of self-interested hypocrisy and that, of course, corrodes alliance solidarity even further. The leader of a voluntary force must lead. It cannot simply push its allies out front.

Thank you, Mr. Chairman.

[Mr. Cooper's prepared statement follows:]

## PREPARED STATEMENT OF HON. RICHARD N. COOPER

My assignment at these hearings is to focus on the impact of U.S. embargoes or trade restrictions on the reactions—verbal and behavioral—of our allies, which I interpret for these purposes to be Western Europe, Canada and Japan (I'm not sufficiently familiar with Australia and New Zealand to comment on their reactions). I understand that the hearings are general in nature, and my remarks will also be general and will allude to earlier episodes. But the current source of tension between the United States and its allies is of course the U.S. order prohibiting firms abroad from using U.S.-licensed technology or parts in sales to the Soviet Union in connection with the gas pipeline.

There are deep philosophical differences of view between Americans and others on the range of issues involved in the use of trade restrictions for political purposes. It will help to understand these differences to identify three quite different purposes which embargoes or trade restrictions may be called upon to serve. First, trade can be restricted to deny the embargoed country the restricted goods for an indefinite period time, with a view to weakening its overall military or economic position. Second, the object could be to induce some change in the behavior of the embargoed country with respect to the events that occasioned the embargo. For example, the restrictions on Iran following their taking of U.S. diplomats as hostages falls into this category. Third, trade restrictions might be used to express disapproval of the events in question even when it is recognized that the behavior of the offending country is not likely to be altered. The restrictions in this case perform simply a symbolic role.

Embargoes among nations are notoriously ineffective at the second function, to reverse offending behavior. (Americans, who from their behavior tend to favor boycotts or embargoes more than other people do, may have been misled over two hundred years ago when their boycott of English goods led to a repeal of the offending British Trade Acts. Even then, though, Parliament let the Tea Tax stand to symbolize its authority, and the ultimate result was war.) Instead, the embargo mobilizes national sentiment and quiets the internal opposition by providing an external adversary and scapegoat, especially when the embargo hurts. This pattern was seen in China after 1950, in Cuba after 1961, and in Rhodesia after 1965.

The symbolic function is sometimes important—for example as a signal to the rest of the world that the United States and its allies considered the Russian invasion of Afghanistan in late 1979 an extremely grave matter. To be effective, it must clearly not be empty—that is, it must visibly pain the embargoing country. To be effective, it must also follow the offending event quickly, be well focused, and preferably command wide support. Public dispute over symbolic actions greatly weakens their value. Moreover, the symbolic function of trade restrictions declines greatly in value over time. Yet they become difficult to relax without also taking on symbolic value.

For a variety of historical and philosophical reasons, Europeans do not like to restrict trade for symbolic or punitive purposes. They believe such restrictions are ineffective. The British are a partial exception as testified by their embargo of Rhodesia in 1965 and of Argentina in 1982, although the former action was taken under considerable pressure for action from the United Nations following Rhodesia's unilateral declaration, and the latter involved a military invasion of British territory—both severe provocations. The other Europeans went along in both instances, in the first case under a United Nations resolution, but without great enthusiasm.

This leaves the first rationale for trade restrictions, denial over a long time with the aim of harming the country that is the object of the restrictions. Outside the military area, Europeans have a different view of this objective too. But European response to U.S. initiatives is further complicated by the lack of clarity in U.S. purposes in imposing trade restrictions. Which exactly of the above objectives is being sought? The Administration, for instance, has publically linked its restrictions regarding the gas pipeline to martial law in Poland. But it is well known that important voices within the Administration were calling for a substantial tightening on trade with the Soviet Union before martial law was declared, and even singled out the pipeline. Europeans therefore suspect that events in Poland were seized on as an occasion to pursue a quite different, long-run objective, which the Europeans do not share. They distrust the position of the U.S. Administration and fear that once restrictions are imposed, for whatever ostensible reason, it will require a major fight to get them off again, no matter what happens in Poland.

With respect to long-run denial, the Europeans have a quite different view of the desirable long-run strategy toward the Soviet Union. By "Europeans" I mean the predominant European view. There are, of course, voices that dissent from the dominant view, just as there are many voices with different views in the United States.

The current Administration's argument, as I understand it, is that the Soviet economy is now severely stretched and relies on credits and crucial imports of machinery from the West in order to sustain its current activities. If these were cutback, the Soviets would have to divert resources at the margin away from their steady military build-up toward the civilian side of the economy. The argument does not apply to grain, it is suggested, because grain absorbs foreign exchange that would otherwise be diverted to productivity enhancing machinery imports. It follows from this view that we could weaken the Soviet Union militarily (relative to what would happen otherwise) by cutting back on credits and machinery exports to the Soviet Union, but not by cutting back on grain. This is a basic long-run view. The notion that we should punish the Russians for the declaration of martial law in Poland provides an occasion to implement it by garnering public support.

A stylized rendition of the predominant European view, in contrast, is that trade with the Soviet Union is more likely to steer the Russians in a benign, liberal direction than are tough economic restrictions. Furthermore, without the option of trading with the West, they argue, Solidarity would not have come into existence, and Hungary would not be pursuing the liberal policy it is. Both of these tendencies toward pluralism within the Soviet bloc were made possible by the opportunity of trading with the West rather than being thrown back on a Soviet monopoly.

Of course trade benefits the Soviet Union—that is not denied. It also benefits the West. This is as true of grain trade, which relieves acute pressures on the agricultural sector, as it is of trade in manufactured goods. But the net gains of trade to the Sovet Union are not likely to effect military budgets there, which get top priority under any circumstances. If anything, a hostile economic posture by the West will induce the paranoid Russians to hunker down and will lead to an increase in the military budget, if necessary by squeezing consumption harder. This is the general lesson to be learned from the political reaction to embargoes throughout history.

The Europeans believe credit is a necessary component of trade. They agree that the high interest rate subsidies to the Soviet Union are unfortunate and should be eliminated, provided it is done in a way consistent with existing commitments (which they see no grounds for breaking), and provided everyone does the same. But the large credit "subsidy" at the present time arises from unreasonably high market interest rates associated with the U.S. Administration's economic policies. Export credit institutions have many outstanding commitments and cannot adjust their practices at once. Their interest rates have risen but not to the undesirable heights of recent U.S. interest rates.

There is broad agreement among all the allies that militarily relevant technology should not be transferred to the Soviet Union. Inevitably there will be disagreement on detailed definitions of what is militarily relevant. There is a large gray area of potentially dual use technology. But the Europeans suspect that U.S. efforts to tighten the definitions—which they might otherwise accept—are just a disguised way to implement the preferred long-run U.S. strategy of general denial to the Soviet Union, or of punishing the Soviet Union for its offensive actions in the world. They agree with neither of these objectives and therefore are suspicious of U.S. efforts to tighten up on the transfer of technology that might be militarily relevant.

American efforts to impose our views on our allies raise a quite different set of issues. First, there is the broad political question of what an alliance is all about and how differences of view should be resolved within one. As proud peoples, our allies do not accept willingly U.S. dictation on issues that they consider of prime importance to themselves. The French are especially sensitive to any suggestion of U.S. dictation. Second, there is the narrower political/legal question of extraterritoriality. The British are especially sensitive on this point and have been for years. In 1980 they passed the Protection of Trading Interests Act in response to threatened U.S. antitrust actions in connection with the uranium cartel. Even when they agree with the substance of U.S. policy, the British are likely to insist on maintaining their formal, legal sovereignty. And indeed, according to newspaper reports, Prime Minister Thatcher has just invoked the Trading Interests Act for the first time in order to compel (under British law) British firms to honor their contracts regardless of what instructions they may be receiving from their U.S. licensor or parent firms. This issue of extraterritoriality has been a past source of friction with our allies, for example, with Belgium and Canada over exports to Cuba from U.S. owned firms in those countries, and with France with respect to exports to China during the period in which the United States embargoed China. Those disputes were ultimately resolved amicably. The current pipeline case is slightly different in a number of respects, since a major U.S. lever is through licenses rather than ownership. But this fine point is likely to be ignored by those who see a petulant U.S. Government reaching for every lever it can in order to accomplish its objectives, even when these do not comport with the foreign policies of allied countries.

The long-run consequences of this extraterritorial reach of U.S. policy will be to discourage reliance on U.S. sourcing and U.S. technology whenever possible. It will of course not always be possible. But over time, in many areas, foreign firms can match the technological prowess of American firms, and under the impact of this kind of policy they will be encouraged to do so by government support to high technology in a variety of ways, with the objective of establishing their "independence" from the United States. They may even go so far as to encourage national ownership of resident firms, along the lines of Trudeau's program for energy in Canada.

These remarks have been very general, without much regard to the particular details of the pipeline case. In addition, however, the Europeans believe that the pipeline is a desirable part of their long-run energy diversification and that its construction will provide welcome relief to their under-utilized manufacturing industries at the present time, especially the steel and machinery industries. The U.S. Administration, for its part, feels that the construction of the gas pipeline will make Europeans too dependent on an important raw material from the Soviet Union, thus increasing the chances that the Europeans will become hostage to the propsect of a cut-off in gas in a way that will influence their future foreign policies and actions.

I have tried to summarize the Administration's position fairly, but I believe the Europeans have the much stronger position in this debate—subject to a few qualifications. But one aspect I have not summarized adequately in this rather detached, academic examination is the fact that the Europeans are simply outraged at the highhanded way in which they have been treated. And they get strong echoes of sympathy in both Canada and Japan. Canadians take the view that theirs was the first country to feel what it is like when the elephant rolls over, and now Europeans are feeling it as well. It reinforces their desire to reduce their reliance on U.S. firms. The Japanese are too polite to express their indignation openly, and their extreme puzzlement at what they consider to be highly inconsistent behavior on the part of the United States. They interpret the inclusion in the U.S. restrictions of the offshore oil-drilling ventures between Russia and Japan, which they hope will diversify their highly uncertain sources of oil, and bring them closer to home, as an attempt to get at Japan—another expression of the anti-Japanese mood which they see building in the United States. It will spur their already considerable efforts to establish their technological independence.

This sharp reaction, of course, raises a whole different set of issues, not inherent in disagreements in judgment and circumstance among friendly and allied nations, namely the cohesion of the alliance itself. The Russians have the satisfaction of observing us doing far more damage to our own interests than we can possibly do to them through restrictions on trade.

My reservations about the European position in connection with the gas pipeline concern their need to develop a fallback position to Soviet gas to discourage the Soviets from considering a possible gas cut-off as a source of leverage on the Europeans. At some expense, such fallbacks can be and, as I understand it, are being developed. They should be sufficient to remove Soviet leverage in this area. My second reservation concerns the seemingly desperate behavior of the Europeans toward exports. Unemployment is high and rising in Europe, but there are ways to relieve it other than by sales to the Soviet Union. And exports—especially those financed with government credits or guarantees—are just as inflationary as are consumption expenditures or government expenditures, e.g. on larger military forces. So while the European desire to export more in understandable, that alone is not an acceptable argument for going ahead with the pipeline. It must rest on other merits. But this point is not essential to the general European argument.

What especially galls our allies is the intolerable inconsistency in the U.S. position—that pipes help the Soviet Union, but grain does not. A sophisticated version that is now being used is that whereas gas is purchased from the Soviet Union, grain is sold and that uses up rather than provides foreign exchange. This version does not go down any easier. It represents a reversion to a mercantilist fallacy that money (in this case the foreign exchange) helps an economy but goods do not. Grain, like machinery, helps the Soviet Union. The allies see the U.S. position as self-interested hypocrisy. A leader of a voluntary force must lead; it cannot just push its allies out front.

The CHAIRMAN. Thank you very much, Professor Cooper. We appreciate very much your statement.

Mr. Rashish, we are happy to hear from you now.

## STATEMENT OF HON. MYER RASHISH, WASHINGTON, D.C.

Mr. **Rashish**. Mr. Chairman, I calculate that if I read my prepared statement it will take 10 minutes, and if I summarize it it will take 15. So I think I will read it. [General laughter.]

The **Chairman**. All right. Fine. Do we have copies of your statement? I did not have one last night.

Mr. **Rashish**. I brought it with me this morning.

The **Chairman**. I have one now. Thank you.

Mr. **Rashish**. The subject of these hearings is clearly a timely one. There exists an inordinate amount of confusion, both in the United States as in the alliance generally, about the question of East-West economic relations and the policies which the United States and other countries of the alliance should pursue with respect to such relations.

You have asked us to address this morning the subject of the reaction of our allies to economic measures against the Soviets. This is the central issue.

My thesis is that, first, the United States—and that applies to any other member of the alliance—cannot pursue an effective policy in this field unless there exists an agreed policy or strategy in the alliance itself. No such agreed policy or strategy exists today, and, if anything, the differences and conflicts over East-West economic relations in the alliance have become sharper and more exacerbated than ever.

The Siberian natural gas pipeline is the current case in point. Second, these differences cannot and should not be papered over, as they have been. There are differences of interests, perception, and attitudes within the alliance, and unless they are explicitly addressed, no coherent policy can emerge.

Third, unless the alliance can come to grips with these issues—and the United States cannot escape the leadership role it has, whether it wishes it or not—the existing consensus within the alliance in other areas, political and security, will become frayed and the growing disarray will become worse.

It simply will not do to talk about "family quarrels" that will solve themselves somehow. Minister Cheysson may have been closer to the mark, as a forecast if not a description of the actual situation, when he spoke of a "progressive divorce" within the alliance. The alliance is not suffering from a head cold from which it will recover in a week's time. The ailment is serious but not, I think, beyond treatment and cure.

We have time and again become bogged down in discussions of particular cases, such as the Siberian natural gas pipeline, without tackling the more difficult question of constructing the coherent approach to East-West economic relations that will serve the alliance for the longer term.

Lacking the sort of institutional framework from which NATO benefits in the area of military security, questions of economic security have been addressed in an ad hoc way, leading to constant bickering and a weakening of Western unity. Since this neglect has not been benign, it is time for a new design to strengthen the alliance voice in our economic relations with the East.

It is inevitable that conflicts will arise among the allies so long as joint economic planning vis-a-vis the Warsaw Pact countries is absent. It is also inevitable that the United States will have to take the lead in establishing the proper consultative mechanism. The United States is no longer a hegemonic economic power within the alliance, but it is clearly the premier power. In recent years, Americans have had trouble coping with this changed role.

Two broad strands of thought can be discerned in the search for a way to adapt to the changed role of America. Neither of these approaches constitutes a policy worthy of the name. One is to go it alone in order to avoid the conflicts that of necessity characterize a relationship among equals. This strikes me as both nostalgic and, ultimately, self-defeating. The alliance will not stand still as America unilaterally pursues its foreign policy goals. American power in the world is closely connected to its membership in a community of like-minded states. A "Lone Ranger" approach which does harm to this vital community prejudices the national interests of our country.

The second form of policy escapism seeks to adjust to the changing balance of power in the alliance by following what amounts to a lowest-common-denominator approach. A devolution of responsibility to our partners born of indecision and lack of vision is not the way to restore strength to the alliance.

What is needed is a policy made in America but which can be exported to Europe and Japan that will guide our economic relations with the East, such as NATO serves our military security. The strains of intimacy need not only be resolved only through separation or the submission of one partner to the other.

In a new relationship among greater equals, our allies as well as ourselves will have to compromise on specific issues from time to time, but our mutual interests will be served by the knowledge that the United States, the stronger partner, has committed itself to a workable strategy that will not make every little storm threaten the very structure of the alliance.

The United States does not have a monopoly of power and consequently cannot expect to will its preferred world in isolation. The alliance on the other hand does have enough critical mass to be an effective agent in world affairs. But this effectiveness is dependent upon consensus within the alliance which, in turn, is the only guarantee of consistency in the application of our policies. As Secretary Shultz has remarked, we must avoid lightswitch diplomacy and must orient ourselves toward a strategy that is sturdy enough to stay the course.

A policy that meets these criteria has never been tried in the area of East-West economic relations. Whatever evidence there may be proving the ineffectiveness of economic sanctions and countermeasures is thus irrelevant to the present discussion. This does not mean that the alliance could successfully conduct economic warfare against the Warsaw Pact countries, nor should we wish to.

Rather, the leverage that we stand to gain from the coordinated approach will be found at the margins. This does not negate the need to pursue such a policy, though. Defense comes before opulence, as Adam Smith warned. We cannot afford to let the market govern our economic security. Making clear that our goals are modest yet constant should be the first step in an alliance designed for East-West economic relations.

Of course, even with such a careful approach, it will not be easy to reach a consensus with our allies on an agenda. There are differences of interest and perception between ourselves and our partners. It is the task of diplomacy—of alliance politics, if you will—to work together to devise a coherent and consistent strategy for the alliance. Otherwise, we will not have a policy which can produce results.

Let me offer as a postulate that it is appropriate to apply economic controls on commercial transactions with the U.S.S.R. These words are from your letter, Mr. Chairman, describing the subject of these 2 days of hearings. We do and should differentiate between economic relations with the U.S.S.R., and indeed among the Eastern European states, and other countries for the same reasons that we differentiate our political, security, et cetera, policy vis-a-vis the U.S.S.R. from those which we apply to other countries.

We do this for a number of purposes, not only to influence the domestic and international policies of the Soviet Union, but also to protect ourselves and to enhance the gains that we derive from such economic relations.

The free play of market forces will not by themselves guarantee the results we seek. We have noneconomic interests that can only be met by measures that limit and influence market forces. The West may have to forego certain economic benefits that derive from the free play of market forces in order to achieve nonmarket goals. There is, in short, a cost to security.

But we practice interventions and controls that limit the play of the market in our economic relations within the West, not only through protectionist devices but through measures that enjoy international sanction, as for example in GATT.

We should try to construct within the alliance an agreed set of rules and principles to guide the conduct of the alliance in respect of economic controls on economic relations with the East. Without this, we will continue to squabble endlessly over particular issues.

Any set of rules must accommodate the divergent interests of the alliance members. This will not be easy, given the differences in interest and perception which exist. In part, these differences reflect conflicts within the alliance over basic policy with regard to the East. It is no exaggeration, it seems to me, to say that the United States sees itself as living in a post détente period while some of our allies see the détente phase as continuing to prevail.

But it is also true that an agreed system of rules would give all alliance members greater confidence that the costs of controls are borne by each and the compulsion to compete to cut deals with the Soviet Union would be diminished.

What might be the elements of a viable alliance policy, of rules and principles to guide economic relations with the East? It is clear what they should not be. They cannot involve a suppression of economic exchanges across the board; they cannot propose the waging of full-scale economic warfare with the U.S.S.R.

The policy must identify the particular aspects of economic relations with the Soviet Union where a differentiated approach serves the interests of the alliance. It seems to me that there are at least four aspects that need to be covered:

First, strategic controls designed to deny goods and technology that contribute to the Soviet warmaking capacity. The COCOM arrangement is the instrument of alliance policy for this purpose. It has been in effect for about 30 years, but needs to be improved.

Second, foreign policy controls or sanctions as a response to Soviet action; for example, in Afghanistan and Poland. Effective contingency planning in the alliance can act as a deterrent. As someone observed, we may not be able to bring the Soviets to their knees, but we may be able to bring them to their senses.

Third, vulnerability controls designed to enhance the economic security of the alliance by limiting dependence on markets or sources of supply in the East which can expose alliance members to the exercise of Soviet influence. The pipeline issue falls under this heading, although it has a number of other facets as well.

And fourth, rules to guide the normal conduct of economic relations with the East so as to induce the Eastern countries to play by our rules and also to discipline the alliance members in order to avoid competition among them in credits, trade, and so on that result in a net transfer of resources to the East, often on terms more favorable than those available in intraalliance transactions.

I have no illusions about the difficulties of reaching agreement on an alliance policy. I have, in fact, experienced a number of these difficulties firsthand. At the same time, I have no illusions about the consequences of failure either. We will continue to be plagued by pipeline, grain, credit, and assorted problems, the cumulative weight of which will seriously weaken the fabric of the alliance.

Since I have not to any extent referred to the pipeline, although I think it will come up in the questioning—it is a bit like playing Hamlet without the Prince—I thought I might ask, Mr. Chairman, if you would want to have for the record an article I wrote, prefaced with an introductory note by Herbert Stein, who is on the second panel today. So it is sort of a double play. This is in the American Enterprise Institute "Economist" of April 1982.

The **Chairman**. We will insert that in the record at this point.

Mr. **Rashish**. Thank you.

[The material referred to follows:]

the AEI economist
American Enterprise Institute for Public Policy Research April 1982

# Economics and National Security

NOTE BY HERBERT STEIN: *The United States and other countries of the Western alliance are at a stage where they must think again about the rationale of their economic relations with the Soviet bloc. Thirty years ago this seemed much clearer than it does today. The countries of the Soviet bloc were regarded as hostile and militarily dangerous, but economically weak. The dominant consideration of our trade and credit relations with them was to avoid contributing to an increase in their military capacity. We agreed with our Western allies not to export to the bloc certain kinds of equipment considered valuable in defense production and to limit credits. The United States practiced more severe restraint than our allies did.*

*In the early 1960s these limitations began to loosen. The United States was no longer such a dominant supplier, our decision not to sell to the bloc was by itself a less effective limit than it had previously been, and none of our Western allies felt that its own restraint was critical. Moreover, the technological capacity of the Soviet Union seemed to be increasing, so that it became unclear whether withholding trade would make more than a marginal difference in the balance of military power. As European trade with the bloc expanded, American businessmen felt that they were the victims of useless restrictions; restraints on U.S. exports, and then on U.S. credits, were relaxed.*

*In the 1970s a new element entered the picture. This was the thought that increasing economic relations with the bloc would reduce political tensions. The motivation, in part, was the idea of "getting to know you": if we trade with each other, we would come to understand each other better and become less fearful and less hostile. To some extent the reasoning was more hardheaded, emphasizing the possibility that the bloc would become more dependent on the West and therefore less willing to jeopardize its economic relations for the sake of political gain.*

*In the past few years, especially since the Soviet invasion of Afghanistan, many questions have been raised about this picture. A large expansion of trade and credit seems not to have reduced the hostility and aggressiveness of the Soviet Union. Also, despite the strength visible in the Soviet military buildup, the economic performance of the Soviet Union and of the bloc as a whole seems poor. Economic growth has slowed markedly in the Soviet Union, and there are persistent difficulties in feeding the population by the standards of a modern industrial nation. One might think that, under*

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*the circumstances, the ability of the West to give or withhold trade and credit would be an important lever for moving the Soviet Union. But the ability of the West to use this lever is limited. This is partly because of a burden-sharing problem.*

*For the Western countries as a whole, gains from economic relations with the bloc, or losses from limiting these relations, are not great. These gains and losses, however, are not evenly distributed; they are concentrated in certain countries and in certain industries. We have no way to compensate the most affected countries and industries for the losses they may suffer or the gains they may forgo through a policy that may be beneficial to the security of the West as a whole. The concerns of the most affected countries and industries are likely to predominate over the more general interest.*

*Since the invasion of Afghanistan, the United States has tried to use economic relations to influence the behavior of the Soviet Union. These efforts have been limited, fitful, without apparent consistency, and without apparent success. It seems urgent now for the United States and its allies to try to formulate a theory and a policy in this field. If economics gives us no leverage, we should stop deluding ourselves, stop irritating our allies by trying to get them to do what they do not want to do, and devote ourselves to strengthening the other levers we do have. If there is some power in the economic instrument, we should agree on how to use it and how to reduce its costs for ourselves.*

*As a contribution to thinking about this subject, this issue of the* AEI Economist *includes an adaptation of remarks by Mr. Myer Rashish, former under secretary of state for economic affairs, to the Chicago Council on Foreign Relations, November 23, 1981.*

## East-West Economic Relations

### Myer Rashish

U.S. trade with the Soviet Union and Eastern Europe expanded considerably during the 1970s, with these countries providing significant markets, particularly for U.S. agricultural products. Our exports of wheat and coarse grains to the U.S.S.R. in 1979–1980 came to 15.2 million tons. Although these exports have made an important contribution to the U.S. economy, we cannot view economic exchanges in isolation. We must ensure that economic relations with the East are consistent with broad U.S. political and strategic objectives. As a result, our trade policy toward the East contains some basic and significant aspects that do not characterize our trade policies toward other countries, mainly because of today's political-military situation.

*"In the final analysis, East-West economic policy rests on achieving an acceptable balance between our security and our commercial interests."*

Most important, the Soviet Union and its Warsaw Pact allies remain the principal threat to Western security. Our economic policies must support our key objectives of deterring Soviet adventurism, redressing the military balance between the West and the Warsaw Pact, and strengthening the Western alliance.

We must keep in mind that in some circumstances trade may enhance Soviet military capabilities. It may also contribute more broadly to Soviet ability to support military programs at levels that Western countries find increasingly difficult to match. Economic relations with the East may lead, less directly, to levels of dependence on those relations that increase Western vulnerability to political influence and coercion by the Soviet Union.

Our trade ties do, however, offer certain opportunities. There are, for example, the obvious benefits to our economy from increased exports. Economic relations may offer an opportunity to influence future Soviet and Eastern European economic and political behavior.

We must recognize that there are important economic and political differences among the Eastern European countries. Some countries are more open to international trade than others; some have moved toward instituting a genuine pricing system and effective tariffs; four are members of the General Agreement on Tariffs and Trade; two (Yugoslavia and Romania) are members of the International Monetary Fund and World Bank; and two (Poland and Hungary) have recently applied. The differing degrees of economic development require that we tailor our approach to the individual country.

In the final analysis, East-West economic policy rests on achieving an acceptable balance between our security and our commercial interests. The United States does not have a monopoly in the trade of goods and services or in finance. We must work with our allies to achieve a common perception of the security dimension of our economic relations with the Soviet Union and Eastern Europe and its implication for economic policy. This is essential if we are to forge in East-West relations an effective strategy and a cooperative policy no less in the economic domain than in the political-security one.

### Energy Security

Let me examine, in more detail, one aspect of East-West economic relations: the Soviet-Western European (Yamal) natural gas pipeline. This project is an almost too perfect example of an economic issue that also intersects political and security issues.

The pipeline will be the largest project ever conceived between the East and West. Gas from the Siberian fields will flow through an enormous fifty-six-inch pipe to several West European countries. This gas will help the Europeans diversify their energy sources and reduce reliance on oil supplies from the Middle East. It will provide hundreds of thousands of jobs for suppliers and will help support depressed industry, particularly German steel. Despite these evident benefits to Europe, the United States has serious reservations about the project.

First, although Europe will depend on Soviet gas for only about 5 percent of its total energy consumption, some regions, like Bavaria, will depend on Soviet gas for as much as 30 percent of their total needs. And it is important to recognize that dependence on gas is qualitatively different from dependence on oil.

Second, the Soviets have a history of cutting off importing countries for political reasons; Yugoslavia, Israel, and China are examples. This dependence would give the Soviets important leverage that could be used on short notice against our allies.

*"Although Europe will depend on Soviet gas for only about 5 percent of its total energy consumption, some regions, like Bavaria, will depend on Soviet gas for as much as 30 percent of their total needs."*

Third, there is a fair probability that accidents or technical difficulties might result in temporary disruptions.

Finally, in a worst-case scenario, a simultaneous disruption of Middle East oil and Soviet gas supplies would put Western Europe in a perilous position.

We also have concerns about the hard currency earnings that would accrue to the Soviet Union. The pipeline will provide the U.S.S.R. with some $10 billion a year in hard currency revenues—at a time when its income from oil exports will be approaching zero. The Soviets need this revenue to keep their military-oriented economy going.

We question also whether the Soviets have the engineering capabilities, equipment, and management skills to construct the pipeline. Their experience in pipeline management has been dismal, and this project could be one of the most difficult engineering challenges yet faced in the energy field.

When the Reagan administration came into office in January 1981, the Soviet-European deliberations had been in progress for more than two years. We communicated very early to the Europeans our concern about the pipeline, especially its vulnerability to disruptions. At the Ottawa summit, President Reagan voiced his concerns and promised that the United States would develop an alternative energy package that could replace the need for Soviet gas.

In November, I led a U.S. delegation to Europe to present the alternative energy package the president had promised and to voice, once again, our concerns about the security of the pipeline. We raised a number of fundamental questions in our talks:

- World energy prospects are considerably better now than when the pipeline was first conceived. Have the Europeans factored into their calculations this revised outlook, which shows a much lower overall energy demand for the 1980s? Will the gas really be needed by the time the pipeline is completed?

*"To determine the real price of the Soviet gas, one must add a 'security premium' to take account of the high costs of security measures. . . . When this added cost is considered, many other alternatives become at least as economic as the Soviet gas."*

- What precautions are the Europeans considering to protect themselves against a possible shutoff of Soviet gas? Do the Dutch fields have enough shut-in capacity to provide extra gas in times of emergency? Do adequate storage facilities exist? Could large industrial users switch to other fuels if supplies were reduced?
- Have alternative sources been adequately considered? The North Sea has abundant gas reserves; gas sources outside Europe could be developed (such as revitalization of the Nigerian Bonny liquid natural gas project); U.S. coal could reduce the need for Soviet gas; oil itself could substitute for gas since oil may be relatively abundant this decade.

The Europeans responded to our questions, but their answers did not mitigate our concerns. The security question had not been satisfactorily addressed by the European countries as a whole. Each country seemed to be relying on the same safety net, Dutch gas. When the numbers were totaled, however, it was evident that the Dutch could, at most, replace only half of the Soviet gas should it be shut off.

The question of alternative sources had not been explored in depth. This is partly because the cost of the alternatives at first glance appears much greater than the price offered by the Soviets. Yet, to determine the real price of the Soviet gas, one must add a "security premium" to take account of the high costs of security measures (storage, dual-fired capacity, Dutch shut-in gas reserves, etc.). When this added cost is considered, many other alternatives become at least as economic as the Soviet gas.

What is it, then, that motivated the Germans, and more recently the French, to conclude contract negotiations with the Soviets? Two things. First, the contract price was very good. Second, the depressed economic situation in Europe induced the Europeans to conclude a deal as quickly as possible. This is as much an economic assistance project as it is an energy program. The United States could offer energy alternatives, but none seemed as beneficial to European economies as the Soviet project.

We had no expectation that we could derail the pipeline negotiations at this late stage. We did hope, however, to persuade the Europeans to pause and review before rushing to a final decision, and we did succeed in some areas. First, U.S. and European positions were clarified. Both sides hold strong views; in fact, I think each underestimated the extent of the other's commitments. Second, we began a dialogue—which the Europeans have urged us to continue, and which we plan to continue—on pipeline security and on alternatives to further dependence on Soviet gas. Third, member nations of the International Energy Agency, at our urging, have agreed to cooperate in establishing an era of natural gas security.

It is easier to lecture than to practice. In this respect, the United States must also consider strengthening its own energy security, and we talked with the Europeans about what we are doing to achieve this objective. Oil decontrol has accelerated oil production to record levels, and the size of the strategic petroleum reserve has doubled in less than a year. The administration proposed and Congress passed a bill to facilitate the private financing of the Alaskan Natural Gas Transportation System, which will enable us eventually to reduce our oil imports by 500,000 barrels per day. In addition, the president has strongly backed the development of nuclear power and expanded coal production for domestic and export purposes. We have made a good start, but we can do more, and this issue will continue to be high on the administration's agenda.

### Conclusion

Today, in light of the events in Poland, the Soviet-West European pipeline has re-emerged as a vital political issue. Perhaps now that the political circumstances have altered, our economic and security arguments will make more sense to the Europeans. We must recognize, however, that the differing views of the United States and our European allies on the type of economic relationship we should pursue with the Soviet Union reflect a basic divergence of approaches. Until this more fundamental issue is resolved, it will be difficult to reach a consensus with our allies on the Yamal pipeline and other East-West economic problems.

There is a philosophic dimension to our economic relations with the East that I would mention in closing. The Reagan administration believes in the free market and in market solutions to economic problems. But there is no market solution to political-security problems; these require explicit decisions and actions by government. As Adam Smith pointed out, defense must come before opulence.

## The Economics of Defense

*This is a statement prepared under the direction of Herbert Stein for the Committee on the Present Danger.*

The most important thing to say about the economics of defense is also the simplest. Defending the country is not free. It has its costs. But so do all other good things—feeding the country, housing the country, and so on. To say that defense, like these other things, has its costs does not imply that those costs are not worthwhile.

The cost of defense is the diversion of productive resources—labor and capital—from other uses. The labor and capital that make military aircraft cannot be used to make video games. The men and women who serve in the armed forces cannot also serve in the police department. But that is true of all other good things. The men and women who raise cattle cannot also run hotels. The question in all these cases is whether the particular use of the resources is more valuable than the alternatives to which they might be put.

People sometimes talk as if there were something special about expenditures for defense in that they yield no product. You cannot eat, drink, wear, or ride in what we obtain for our national defense expenditures. But of course there is a product. The product is the national security. That is an extremely valuable product. Without it, most of the other products will not last for long or be worth very much.

It is possible to spend too much or too little on national defense, just as it is possible to spend too much or too little on housing, or on fire departments, or on anything else. Even if it is agreed that more spending for defense yields more national security there is a point beyond which the addition to the national security is too small to be worthwhile. Also, even though less spending on national defense would leave more output available for other good purposes, there is some point beyond which reducing spending for defense is obviously too risky. The problem is to find the right point.

*"The relevant debate today is about the difference between spending 5½ percent of the GNP for defense and spending 7 percent on defense. . . ."*

During World War II the United States devoted about 50 percent of its national output to the war effort. No one thought that was too much. No one now thinks anything like that is needed today. In the 1920s we spent less than one-half of 1 percent of our national output for defense. Hardly anyone thinks that would be adequate today. The relevant debate today is about the difference between spending 5½ percent of the GNP for defense and spending 7 percent on defense, despite the fact that the Committee on the Present Danger believes that the defense program proposed by the administration is inadequate. In fiscal 1981 the United States spent about 5½ percent. The president proposes raising that to about 7 percent by 1985.

The choice between the 5½ percent program and the 7 percent program depends mainly on the assessment of the national security risks and of the contribution which the additional defense spending makes to the national security. (These questions are discussed in our basic paper "Is the Reagan Defense Program Adequate?"[1]) But the choice also depends on the assessment of the cost. This aspect of the choice will be considered here.

> *"When we confront huge defense expenditures for a short period—as in most wars—we typically and properly pay for them in part by borrowing. That is not appropriate for the kind of low-level defense program which we must be prepared to sustain for a long time. But neither is it necessary. It is possible to pay the cost of defense in better ways than running a deficit."*

The fundamental implication of spending 1½ percent more of the GNP on defense is that we shall have available 1½ percent less of GNP for all other purposes—private consumption, private investment, and non-defense expenditures of government. In real terms this means something like this: the administration estimates that real output will rise by an average annual rate of 3.5 percent between 1981 and 1985. If the defense fraction were held constant, the output available for non-defense purposes would also rise by 3.5 percent per annum. But if the defense program rises as the administration proposes, real output available for non-defense purposes will rise by an average annual rate of 3.2 percent. The difference between this 3.2 percent annual increase and the 3.5 percent we would have if we kept the defense share constant is the most general measure of the cost of the administration's defense program.

The Congressional Budget Office makes a lower, and probably more realistic, estimate of the increase in real output in the next several years. But this estimate does not change the picture markedly. According to the CBO estimates, output available for non-defense purposes would rise by 2.7 percent per annum if the defense share was constant and would rise by 2.3 percent per annum with the administration's defense program.

Even with the CBO estimate of the growth of real output, the output available for non-defense purposes would rise more rapidly between 1981 and 1985 than it did between 1977 and 1981.

There is little doubt that the direct cost of having a defense program equal to 7 percent of GNP rather than 5½ percent of GNP is small. That is, if the additional expenditure makes a significant contribution to the national security it is hard to argue that the diversion of 1½ percent of GNP to that purpose is an excessive burden on the economy.

One must look, however, at possible indirect effects. These effects become most visible when we look at the federal budget because the process of bringing about the diversion occurs through that budget. It will not be possible to skim 1½ percent of GNP equally off all persons and all uses of output, and the choice of where and how to divert GNP to defense will influence the consequences. That choice will be made through the budget.

For example, suppose that the expenditure of an additional 1½ percent of GNP for defense was financed by a federal deficit. The main effect would be that the government's borrowing to finance the deficit would crowd out private investment. Roughly speaking, the 1½ percent of additional GNP going into defense would come out of the 6 percent or so of net private saving and net private investment. Thus, what is a small diversion from total output would be a very large diversion from the small but critical part of total output that goes into net private investment.

Financing the expansion of the defense program by borrowing would increase the costs of the expansion. It would repress private investment and the future growth of the economy. When we confront huge defense expenditures for a short period—as in most wars—we typically and properly pay for them in part by borrowing. That is not appropriate for the kind of low-level defense program which we must be prepared to sustain for a long time. But neither is it necessary. It is possible to pay the cost of defense in better ways than running a deficit.

We are talking about financing the difference between a defense program equal to 5.5 percent of GNP and 7.0 percent of GNP—or of financing 1.5 percent of GNP. That is almost exactly the size of the deficit projected for 1985 under the administration's budget. The tax cuts enacted in 1981 are estimated to reduce the revenue by 4.2 percent of GNP in 1985. Thus, to finance the defense expansion program in 1985 by revenue increase would require an increase equal to about 35 percent of the cut made last year. Non-defense expenditures of government, after the cuts proposed by the Reagan administration, would be about 14 percent of GNP. Thus, to finance the defense expansion by other expenditure cuts would require a cut of about 10 percent, or, more probably and more reasonably, some combination of revenue increases and expenditure reduction could be used to eliminate the deficit. This can be done without seriously impairing economic incentives or neglecting important functions of government.

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[1] Published by the Committee on the Present Danger, March 1982.

It is helpful to look back at the last year when we had a balanced budget and compare it with the Reagan budget for 1985.

| | *1969 actual* | *1985 proposed* |
|---|---|---|
| | *(% of GNP)* | |
| Total expenditures[a] | 20.2 | 20.9 |
| Defense | 8.7 | 7.0 |
| Non-defense | 11.4 | 13.8 |
| Total receipts | 20.5 | 19.1 |
| Surplus | 0.4 | −1.7 |

a. Components do not add to total because of rounding.

There is a deficit in prospect now, even though a smaller share of GNP is to be spent for defense because a larger share is to be spent for non-defense purposes and a smaller share is to be collected in taxes.

To raise the revenue or cut the non-defense expenditures needed to finance the defense expansion will not be pleasant or politically easy. That is only saying in another way what was said at the outset, that defending the country is not costless. But the cost of the proposed program is not basically different from what is suggested by saying that it requires diverting an additional 1½ percent of GNP to defense.

A common concern about the defense expansion is that it may be inflationary. Of course, there is a historical connection between wars and inflations. But whether or not that is a necessary connection, there is no such necessary connection between inflation and a defense program of the kind now proposed by the administration. The argument here is perfectly simple. What causes inflation is an excessively rapid growth of *total* spending—public and private. If the growth of defense spending is financed in a way that brings about a slowdown in non-defense spending there will be no inflationary pressure of demand. That requires that the increase in defense spending be balanced by increased tax revenue or by a slowdown of non-defense spending or that monetary conditions be maintained which will keep the deficit from being inflationary.

In fact, most economic forecasters, inside and outside the government, taking account of the proposed defense increase, predict that the inflation rate will come down during the next five years. That is perfectly consistent with what is expected of overall fiscal and monetary policy.

It is worth noting that during the administrations of Presidents Eisenhower and Kennedy, when defense expenditures were 9 to 10 percent of GNP, there was little inflation. Also, the acceleration of

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inflation in the 1970s occurred while defense expenditures as a share of GNP were falling to their lowest level in thirty years.

The point is often made that although defense expenditures will not be large relative to *total* GNP, and can be financed in ways that do not increase the inflationary pressure of *total* demand, nevertheless the defense demand is concentrated on certain industries, materials, and skills and will be inflationary in those sectors. This is closely connected to another point. It is said that the effort to increase defense procurement *quickly* will drive prices up and cause waste in other ways, so that the program would be achieved more efficiently if it were pushed more gradually.

> *"Of course, there is a historical connection between wars and inflations. But whether or not that is a necessary connection, there is no such necessary connection between inflation and a defense program of the kind now proposed by the administration."*

There are several things to say about this:

Part of the normal and efficient process by which resources are diverted to the sectors in which there is increasing demand is a rise of prices in those sectors relative to the sectors in which demand is not rising or is declining. We *want* prices and wages in the defense sectors to rise relative to prices and wages elsewhere enough to attract the labor and capital needed for the defense effort. But, if overall economic policy is not inflationary, this need not raise the overall price level. There will be restraint of demand in the non-defense sectors which will slow down price increases there.

Although some shift of relative prices is natural and necessary, this shift will probably not be very great in the next several years. That is because the planned program will not put a great strain on important specialized sectors of the economy. The program does not include many new systems requiring extraordinary absorptions of scientists and engineers in their development. The program begins at a point where defense production is very low. Important parts of the program can be achieved by increasing output up to the level of capacity already existing, and that will reduce rather than increase unit costs. Industrial production in the defense and space industries is a little less now than it was in 1968, whereas total industrial production early in 1980 was 40 percent higher. In 1972 defense procurement absorbed 8.4 percent of the output of the heavy and technological industries, where supply difficulties are most likely to be encountered, insofar as they are encountered at all. By 1977 this ratio had fallen to 6.1 percent. It has since, in 1981, recovered to 7.3 percent. With the president's program it would rise further to 10 percent in 1985. This does not look like a program that will put great strain on many sectors of the American economy.

Of course, there will be points at which slowing down the program will reduce its cost. But it will also be generally true that slowing down the program reduces its value. A plane or a tank delivered ten years from now is not as useful as one delivered five years from now. This has to be taken into consideration, and there is no general principle for answering how much saving is worth how much delay. This has to be decided on a case-by-case basis.

There is a large problem in managing the expansion of the defense program. It will go more efficiently, quickly, and economically if it is well managed. Decisions about the congressional authorization and appropriations should be made promptly and contracts should be let quickly so that contractors can prepare in an orderly way. The Department of Defense should push forward with its program for expanding the list of qualified contractors and informing potential producers of future defense requirements. The Department should have authority to assist in the building of plant capacity that may not otherwise be available.

At a more general level, the effects of the defense expansion on the economy will depend on the monetary and fiscal policy that accompanies it. But the most significant thing to say is that with reasonably intelligent policy the burden of the program on the economy will not be excessive.

The **Chairman**. Those are three splendid statements and are very challenging. I think the commonality they have is that we recognize that we have a real problem and that the proper handling of that problem is manageable and can be resolved. And that, of course, is the whole purpose of this hearing.

I would like to ask first a question based on a comment I made yesterday. On the previous day a diplomat from Europe, a strong friend of this country, an outstanding diplomat, said that for the first time in his memory it is really popular throughout Europe to be anti-American in almost any group you sit with.

Is this acrimony over economic policy essentially? What other areas do you see this stemming from, if you agree with him that there is this attitude? And to what degree is it attributable to inept handling of our policy problems with European countries? Or to what degree is it just inherent in a different perspective on trade with the Soviet Union that they have had for many years with us? Professor Cooper?

Mr. **Cooper**. I will attempt to respond, although I would ask you to keep in mind that it is difficult to characterize the views of 250 million independent-minded Europeans. I would hesitate to be on the other side of the Atlantic trying to characterize the American view of certain issues.

But I would say unambiguously, taking the diversity of European opinion into account, that this emergent anti-American attitude, which all of us who deal with Europeans feel, does not arise merely from economic issues. I would even say that it does not arise mainly from economic issues, although there is clearly a heavy economic component in there.

Rather, it arises, in part, from a feeling that the United States approaches world political problems primarily in military terms, sees them primarily in military terms, whereas the Europeans consider a strong military position a necessary but by no means a sufficient condition for dealing with world problems.

They think that the United States relies much too little on the subtle skills, which the Europeans ascribe to themselves, of diplomatic and political maneuvering. This is a general theme which has gone back many years in United States-European relations. It is heightened in these last 2 years by the very strong and vocal emphasis which the U.S. administration has put on the importance of military as opposed to other dimensions of foreign and security policy.

There is a second aspect which arises out of economic issues but I think the focus is not on the economic issues themselves but on our handling them. That is what I tried to convey in my oral remarks. The sense of outrage at the way the Europeans have been treated. It is true that the content involves economic issues, and the Europeans regret the lack of American appreciation for the importance of these economic issues to Europe—both in terms of energy diversification and in terms of the orders for European industry that are involved in building the pipeline. But I think that is secondary to concern about the way the Europeans have been handled.

You may have seen an article in the Post 2 weeks ago by a distinguished German journalist who says Europeans are tired of being treated like banana republics. I think it is that sense of how they are being handled rather than the actual content of the disagreement which is the source of this emerging anti-American attitude.

The **Chairman**. While you are still speaking, could you just comment briefly, since you just came back from Japan, on whether you perceive a difference in the way the Japanese and the Europeans perceive the U.S. sanctions?

Mr. **Cooper**. The Japanese are different in temperament from the Europeans, and they differ also in their historic ties to the United States. Both of those features, I think, give rise to a much more muted public response by the Japanese as compared with the Europeans. The Europeans, if you like, are more American in this respect. They are more vocal about their disappointments and disagreements with the United States. The Japanese tend to suppress them.

But there is no doubt that there is a deep indignation in Japan at present about the way they are being handled, although they see the main confrontation on trade with the Soviet Union as between the United States and Europe.

The **Chairman**. Could it be conditioned by the fact that on balance their economy benefits from it? The figures are given by Caterpillar that we used to have 85 percent of the pipelaying business and Komatsu of Japan 15. And now the figures are exactly reversed. It is 85 for Japan and 15 for us. Are they truly benefiting from our sanctions?

Mr. **Cooper**. Well, they are benefiting to the extent that the United States denies U.S. firms the possibility of getting the business, and that was certainly the case for the pipelaying equipment, for example, when Caterpillar was denied and Komatsu picked it up. That creates some ambivalence in the Japanese position.

But it is also true that they have been caught by our restrictions. Since there is less direct American investment in Japan, the extraterritorial application to U.S.-owned, Japan-based firms is less important than it is in Europe. But the Japanese rely heavily on American technology. As I mentioned, the restrictions on American components and technology blocks the offshore drilling ventures, which were joint ventures between the Japanese and the Soviet Union, and the Japanese are extremely disturbed by that.

The **Chairman**. Thank you. Let us try to move on to the others to respond to the question as quickly as we can.

Mr. **Cooper**. Yes. The other dimension is just puzzlement, bafflement. They still do not feel that they understand the United States as well as the Europeans feel, rightly or wrongly, that they do understand the United States. And so they are completely baffled as well as being indignant.

The **Chairman**. Thank you.

Dr. Rashish.

Mr. **Rashish**. Mr. Chairman, I find myself feeling very uncomfortable as I listen to Dick expound what I would describe as a mea culpa breast-beating approach to who is at fault in these alliance problems.

There is an asymmetry in the alliance. When the Europeans do something stupid, we are fairly indulgent and passive about it. When we do something stupid, the Europeans go up in arms. When the Japanese do something trifling, both the United States and the Europeans go into orbit.

I suspect that that is a compliment to the United States. We are so important to our alliance partners, our weight is so considerable, that whatever we do has consequences that are so substantial that the response tends to be exaggerated. That is a penalty of leadership. It is one we ought to be able to suffer with a certain amount of equanimity.

At the same time, the truth is that we do things that are stupid from time to time that are not particularly constructive or useful. We should avoid doing them because the consequences of the United States doing these things is a good deal greater than the consequences of either Japan or Europe doing them.

As Dick Cooper said, there is no uniform European view. It is a set of views that run across the whole spectrum. But I just take it as a given that the Europeans are going to complain and yell holy murder whenever we do anything that disturbs them. And unless I am persuaded that what we do is stupid, it does not trouble me too much. It is part of the game.

The CHAIRMAN. Mr. Ellsworth, you mentioned a second proposed gas line in your oral comments. What is that proposal specifically geographically, and which countries would it feed?

Mr. ELLSWORTH. I do not know that there is a proposal on the table.

The CHAIRMAN. You said you expected that there would be one.

Mr. ELLSWORTH. I am sure that there will be one.

The CHAIRMAN. Yes.

Mr. ELLSWORTH. But, of course, not having seen it yet, I cannot describe it exactly.

The CHAIRMAN. Of course.

Mr. ELLSWORTH. But I am assuming that it would be essentially a parallel operation substantially supplementing and adding to the present project.

The CHAIRMAN. What realistic prospect do you see of the Soviets buying your proposition that they underwrite a portion of Western loans to Eastern Europe in response for a measure of stability in Eastern Europe? I found the Soviet leaders not even willing to discuss this kind of issue when I raised it with them in connection with Poland in the Kremlin in November 1980.

Mr. ELLSWORTH. Yes. First of all, I did not know that you had suggested that line of thinking to them, and I want to thank you for doing that at an early stage. But I think that the chance of their agreeing to that is practically zero unless they are forced to.

And I think that probably the only way to force them to do so, after we are sure that we have protected our Western banks from the consequences of doing it, is to declare Poland in default on its loans and then sit and wait and let the Soviets decide whether they want to step forward and shoulder a share of the responsibility or not. Otherwise, I think there is no chance of getting them to do it.

The CHAIRMAN. Thank you very much.

Senator Tsongas.

Senator TSONGAS. Mr. Chairman, I would like to have inserted into the record two articles that appeared in today's newspapers, in the Washington Post and in the Times. The Times piece is entitled

"Europe Protests Bans by Reagan on Gas Pipeline." And the Washington Post article, "European Community Protests U.S. Sanctions Against Pipeline."

The CHAIRMAN. They will both be incorporated at this point in the record.

[The articles referred to follows:]

[From the New York Times, Aug. 13, 1982]

## EUROPE PROTESTS BANS BY REAGAN ON GAS PIPELINE

### FORMAL RESPONSE CITES "INTERFERENCE" BY UNITED STATES

WASHINGTON, Aug. 21.—European officials, angered by President Reagan's ban on pipeline equipment sales to the Soviet Union, delivered a formal protest today charging that the ban was "an unacceptable interference" in European Economic Community affairs.

The long-expected formal protest adds to the pressure on the Administration to reverse the ban. Several European governments have announced that they will defy the ban, and the House Foreign Relations Committee, dominated by Democrats, voted on Tuesday in favor of a bill that would require the President to cancel the sanctions, which were imposed last December in response to the military crackdown in Poland.

Otto Borch, Denmark's Ambassador to the United States, and Roland de Kergorlay, head of the Community delegation here, delivered the legal papers to officials at the Commerce and State departments. They asked that the Administration cancel the restrictions.

### RESTRICTIONS WERE BROADENED

B. Jay Cooper, a Commerce Department spokesman, said the European officials met briefly with Guy Fiske, the Deputy Commerce Secretary, and Sherman Unger, the department's general counsel. The papers "were referred to Unger for review and study," Mr. Cooper said.

The sanctions prohibit American companies and their foreign subsidiaries from selling equipment to build the 3,600-mile pipeline that will deliver natural gas from Siberia to Western Europe, starting in 1984.

In addition, the restrictions were broadened on June 18 to penalize foreign companies that sell the Soviet Union pipeline equipment that uses technology licensed from American companies in Italy, France, Great Britain and West Germany. The governments of all these countries except West Germany have ordered the companies to honor pipeline contracts, in defiance of the Reagan Administration ban.

The formal European protest said it was not likely that the restrictions would "delay materially the construction of the pipeline or the delivery of the gas." They said that the ban contains "sweeping extensions of U.S. jurisdiction which are unlawful under international law."

It added that the rules "seem to run counter to criteria of the Export Administration Act and also to certain principles of U.S. public law."

The European protest took particular note of the sanctions against foreign companies using licensed American technology. The Reagan Administration would enlist the support of foreign companies by "threatening them with discriminatory sanctions in the field of trade," the appeal said. According to United States officials, the companies could be barred from receiving exports of American goods and technical data. The Export Administration Act provides for other remedial measures as well.

The Community also complained to the Administration about the economic hardship posed to companies that work for concerns covered by the restrictions.

"Though they may use no American technology, they will suffer complete loss of business if the European contribution to the project is blocked," the Community said. "Some of these companies may not survive."

[From the Washington Post, Aug. 13, 1982]

## EUROPEAN COMMUNITY PROTESTS U.S. SANCTIONS AGAINST PIPELINE

(By Bradley Graham)

BONN, Aug. 12.—The European Community, in a strongly worded formal protest to the Reagan administration today, attacked U.S. sanctions against the projected Soviet gas pipeline as violations of both international and American law and predicted they would backfire on two fronts.

Unless the latest U.S. restrictions are lifted, the European governments warned, trade relations between the United States and its European allies will be damaged "unquestionably and seriously"and the Soviet Union will be encouraged to step up its own manufacturing potential to complete the pipeline on time.

These claims were forcefully spelled out in a note that accompanied a detailed, 14-page list of legal arguments against President Reagan's June decision to extend the prohibition on the use of U.S.-developed technology in the planned pipeline to European subsidiaries of American companies and to holders of U.S. licenses.

The 3,500-mile pipeline will carry natural gas from Siberia to Western Europe. The project will cost about $10 billion and involves billions of dollars in contracts with Western European companies.

The statement was approved by all the European Community governments.

[The State Department acknowledged receiving the protest and said it was being studied, Reuter reported in Washington. A spokesman said the protest note had been expected as part of normal procedures.]

"The European Community considers the U.S. measures contrary to international law, and apparently at variance with rules and principles laid down in U.S. law," the statement said.

The extraterritorial reach of national regulations has been a disputed issue in European courts for some time. But Western European leaders clearly regard Reagan's decision as an affront to national sovereignty. They also object to its retroactive application to signed contracts.

U.S. officials have argued that European companies participating in construction of the pipeline and relying on U.S. licenses signed contracts long before the Soviet deal was negotiated, binding them to respect American law regarding the export of sensitive U.S. technology. But European officials maintain that this promise to abide by U.S. law held only until contracts for the reexport of goods for the pipeline were signed with the Soviets last fall.

Beyond the legal arguments, the European governments said in their joint statement, "It is unlikely the U.S. measures will in fact delay materially the construction of the pipeline or the delivery of the gas. The pipeline from Siberia to Western Europe can be completed using Soviet technology and production capacity diverted from other parts of their current program."

The technology ban has hit $3 billion worth of contracts between the Soviet Union and firms in Britain, France, Italy and West Germany at a time of economic difficulty in Europe and sharp U.S.-European policy differences over the use of trade generally as a political lever in East-West relations.

Britain, France and Italy have instructed firms in their countries to ignore the American ban, while West Germany, reluctant to go quite as far without the domestic legal instruments that are available to the others, has promised political and moral support at least for companies fulfilling pipeline contracts.

On Monday, West Germany's AEG-Telefunken, the insolvent electrical giant, announced that it would go ahead with September delivery of the first two compressor turbines ordered by the Soviets. The machines contain rotor blades made by General Electric and covered by Reagan's ban.

"The recent U.S. measures," the protest note said, "provide the Soviets with a strong inducement to enlarge their own manufacturing capacity and to accelerate their own turbine and compressor developments, thus becoming independent of Western sources."

While U.S. officials have predicted that the embargo could delay the project by up to two years, the Europeans pointed out that this would not prevent Moscow from selling new gas to Western Europe exactly on time.

"Gas could still flow to the community starting as scheduled in 1984," the Europeans' statement said, "owing to the existence of substantial spare capacity in the existing pipeline system, sufficient to cover the requirements of the early phases of the program of deliveries."

The **Chairman**. I would like to have inserted into the record the full text of the comments delivered by the European Community regarding the June 22 U.S. extension of oil and gas equipment sanctions. I would ask that this be inserted after the newspaper accounts of the EC protest.

[The material referred to follows:]

[From the New York Times, Aug. 13, 1982]

### TEXT OF COMMON MARKET STATEMENT ON EMBARGO

Brussels, Aug. 12 (Reuters).—Following is the full text of the message delivered today by the European Common Market in Washington, criticizing President Reagan's embargo on technology for the Soviet Union's natural gas pipeline project:

1. With reference to the interim rules promulgated on 22 June 1982 by the Department of Commerce under the Export Administration Act of 1979 and to the community's note presented on 14 July 1982, the European community wishes to present further comments on the new export administration rules, with the request that this note and these comments be transmitted to the Department of Commerce in accordance with that department's invitation for public comments to be made by 21 August 1982.

2. The European Community wishes to draw attention to the importance that it attaches to the legal, political and economic aspects of the United States measures, including their impact on the commercial policy of the Community. As to the legal aspects, the European Commmunity considers the U.S. measures contrary to international law, and apparently at variance with rules and principles laid down in U.S. law.

3. As to the political and economic aspects, it is clear that the U.S. measures are liable to affect a wide variety of business activities, while their primary purpose is to delay the construction of the pipeline to bring Soviet gas to Western Europe. The European Community holds that it is unlikely that the U.S. measures will in fact delay materially the construction of the pipeline or the delivery of the gas.

The pipeline from Siberia to Western Europe can be completed using Soviet technology and production capacity diverted from other parts of their current program.

Furthermore, the recent U.S. measures provide the Soviets with a strong inducement to enlarge their own manufacturing capacity and to accelerate their own turbine and compressor developments, thus becoming independent of Western sources. Gas could still flow to the community starting as scheduled in 1984 owing to the existence of substantial spare capacity in the existing pipeline system, sufficient to cover the requirements of the early phases of the program of deliveries.

4. One of the main elements of the Community's policy of reducing the vulnerability of its energy supply is based on diversification of sources. Gas from the Soviet Union will help to conserve the Community's own stock of gas, oil and other fuels, and will reduce the Community's own reliance on other foreign sources. Use of Siberian gas will not create a dangerous dependence on that source. Even when gas is flowing at the maximum rate, in 1990, it will represent less than 4 percent of the Community's total energy consumption.

5. Whatever the effects on the Soviet Union, the effects on European Community interests of the U.S. measures, applied retroactively and without sufficient consultation, are unquestionably and seriously damaging.

Many companies interested as subcontractors, or suppliers of components, have made investments and committed productive capacities to the pipeline projects, well before the American measures were taken. Though they may use no American technology, they will suffer complete loss of business if the European contribution to the project is blocked. Some of these companies may not survive. Major European companies that can survive the immediate loss of business will nevertheless suffer from lower levels of capacity utilization and loss of production and profits, while workers will be laid off temporarily or permanently.

6. In the longer term, European Community companies may be damaged by the disruption of their contracts concluded in good faith, because they may cease to be reliable suppliers in the eyes not only of the Soviet Union but also of their actual and potential business partners in other countries.

#### BUSINESS CONFIDENCE

One inevitable consequence would be to call in question the usefulness of technological links between European and American firms, if contracts could be nullified at any time by decision of the U.S. administration. Another consequence to be feared is that the claim of U.S. jurisdiction accompanying U.S. investment will create a resistance abroad to the flow of U.S. investment.

Thus, these export control measures run counter to the policy aims of the United States of easing the transfer of technology and of encouraging free trade in general. There will be other far-reaching effects upon business confidence. These measures thus add to the climate of uncertainty that is already pervading the world economy as a whole.

7. The European Community therefore calls upon the United States Administration to withdraw these measures.

Senator TSONGAS. Thank you.

In many respects, Mr. Chairman, the witnesses are preaching to the choir. The views that they have expressed are similar to yours, I suspect, and to my own.

Let me just state for the record that the House yesterday voted, I believe it was 22 to 12 or something like that—I do not know whether anybody has the exact vote—to reverse the decision by the President on the pipeline.

I concur with that. And I will be introducing the exact——

Mr. RASHISH. Just so you do not have the wrong impression, I am a discordant voice in the choir that you thought you listened to singing in harmony. I would not endorse that action of the House of Representatives for a minute. I thought it was silly.

I am not prepared as Bob Ellsworth is to say that the Europeans are making sound, sensible decisions on diversification of their energy sources with a prudent concern for their security interests. I think they have precisely not done that. And by focusing on the President's decision on June 18 to extend the sanctions and by arguing that that was an unwise decision, which I think it was, I think we are in danger of expiating the Europeans from any responsibility for their stupid policies that they have been following, which I think were quite against their own interests.

It is just unfortunate that that is the way public issues get couched. The President makes a decision. Everybody focuses on that decision. The decision was not, to my mind, a wise one. And then, everybody neglects the central issue, which is whether the whole pipeline exercise makes sense, whether it serves the security of Europe, whether there are not alternatives, whether the Europeans have, in fact, done the kind of careful and prudent planning which they should have done, and I do not believe they did, before they entered into this contract.

You have here a case of displacement of issues. The issue now becomes the President's decision and not what is really at issue, and that is the whole pipeline business. That is my discordant voice.

Senator TSONGAS. Well, then your discord is duly noted.

Mr. RASHISH. Excessively, I suspect.

Senator TSONGAS. No; my only hesitation with what you said is whether, in essence, two stupidities make a wisdom. Granted—and there may be questions about what the Europeans have done—from their perspective, they feel that they have not put themselves into a position of dependency on the Soviets. But my concern is what has happened in terms of the NATO alliance.

I think the pipeline decision, had it not been followed by the grain embargo decision, would have been perceived differently. It is very difficult to argue with you. I have met with a number of Europeans, and I have asked them what is the difference as you perceive it between the grain embargo decisions and the pipeline? There are differences. But some, I believe, refer to it as self-interest and hypocrisy. That was the view of the Europeans, and that is exactly what I get back, and then some.

Now, whether that is accurate or inaccurate is immaterial, if that is the perception, because that is what alliances are built on: How we perceive each other.

So I would hope that the administration would be sensitive to how the Europeans are feeling and make some movement in the right direction.

So by introducing that, "adding one stupidity to another or a third to the other two," as a signal to the administration that there are those of us who are concerned about what has happened, I have, among others, thought that a meeting with the President on this issue to try to discuss our differences would make a great deal of sense.

But beyond that, I think there needs to be some independent expression of the feelings of the Congress so that the Europeans do not think that we all endorse the pipeline decision, that we are not all involved with that particular stupidity, as you stated, but we may have our own, but that does not happen to be one of them.

Let me ask a question of you. The Europeans's reaction obviously is also a function of the economic strain they are under. I suspect that if everybody had a very vibrant GNP, et cetera, and strong economy, that you would not have this kind of discussion.

The Europeans have looked at two Secretaries of State, Mr. Haig and Mr. Shultz, both of whom have ties, strong ties, internationally, especially in the case of Mr. Haig. And yet there seems to be disarray in the alliance.

My own view is that they do not blame either Mr. Haig or Mr. Shultz for what is going on, but rather—how do I say this delicately—the "John Wayne instincts" of the President as a kind of instinctive anticommunism which the Europeans would view as not only unsophisticated but also very ineffective.

Is that an overstatement? Is that reflective? I am not saying it is right or wrong. But is that how the Europeans view what we are doing?

Mr. COOPER. Senator, I think there is a bit of a problem getting three Americans before a hearing and then asking them what is the European view. If would have thought that the best way to get European views is to ask some Europeans. But my impression is the same as yours.

Senator TSONGAS. Let me just state that we have all done that, but the rules of the committee do not allow non-Americans to testify.

Mr. COOPER. I did not appreciate that. There are other committees that I know who have gotten Europeans. But this committee has its own rules.

But my impression is the same as yours. The image of the Lone Ranger, which was associated with the Nixon administration and so forth. What is a little hard to sort out is the extent to which these views are genuine Eurpoean views and the extent to which they are picking up metaphors which are produced by Americans in commenting on ourselves.

But there is no question, I think, that whatever the origin of the "John Wayne" image, as you put it, it resonates with the Europeans. They have seen that as a problem for years, and this has nothing to do with the current administration. For years Europeans have had a much higher opinion of their own sophistication in managing foreign affairs than they have had of American sophistication in foreign affairs. And from time to time—and my own view is the current time is one of them—that basic view gets reinforced by U.S. actions.

Senator TSONGAS. Was that true during the Nixon period?

Mr. COOPER. That was also true during in Nixon period. It was true during the Johnson period. It was true during the Eisenhower period. I was living in Europe during the 1950's, and it was a standard theme. That is the conventional wisdom in Europe. It is that the Americans are great, full of enthusiasm and energy, they are dynamic and so forth, but they are just a little bit ham-handed.

Senator TSONGAS. My understanding was that that feeling did not prevail so much during either the Kennedy years or the Nixon years.

Mr. COOPER. Well, keep in mind that it was during the Nixon years that the "year of Europe" was launched, and it fell just like a lead balloon in Europe. There was appreciation for what was done with respect to American policy toward China, but the Europeans considered that as simply undoing a mistake that Americans made years before.

There was fascination, rather than appreciation, but a fascination nonetheless, with our actions, particularly Secretary Kissinger's actions, in the Middle East. And there was also appreciation for the endorsement by the Nixon administration of détent which the Europeans would take credit for having started several years before, the "Ostpolitik" of Germany.

But nonetheless, I think they still felt that there was a certain lack of subtlety in some aspects of American policy during that time.

Senator TSONGAS. Someone once said to me that the Europeans always wish that the administration had just left office. Would you share that view?

Mr. COOPER. I do not understand the metaphor.

Senator TSONGAS. That once someone is out of office and they experience the next administration, they have a fondness for the one that just passed away.

Mr. COOPER. That is right. They have learned that the first 2 years of any new administration is basically a learning period and they have a certain amount of patience and forbearance during that period. But they consider it a matter for regret for the alliance as a whole, that Americans change their political leaders so often, that they are always educating new presidents in foreign affairs.

Senator TSONGAS. Let me say, Mr. Chairman, that I do not want to pursue this since I am sure the statements were rather complete, but I would just state at a personal level that Mr. Ellsworth was a Member of the Congress back when Brad Morse was also a

Member, and when I was an intern I did some work for Mr. Ellsworth.

Mr. Ellsworth, when I worked for you, at that point you were very well thought of, and it is very good to see you.

Mr. ELLSWORTH. Thank you.

Senator TSONGAS. Thank you, Mr. Chairman.

The CHAIRMAN. Thank you, Senator Tsongas.

In this insert which you have made for the record, which I presume most of you have seen this morning in the New York Times, it concludes that one inevitable consequence of the unilateral sanctions by the United States would be to call into question, as I say, the usefulness of technological links between European and American firms if contracts could be nullified at any time by decisions of the U.S. administration.

Also, of course, manufacturers particularly in Illinois, a State most vitally affected by these sanctions not involved in the pipeline but by the sanctions across the board, have presented their views in a meeting I arranged at the White House and strongly argue that we are appearing to be unreliable as suppliers. What country would buy American then if any time a different political decision comes up and there could be a sanction and spare parts cut off. So they have equipment sitting out there which they cannot make serviceable.

Do any of you have any comments on those two aspects of whether it does, in a sense, call into question the usefulness of technological links which are basic to the last program at least for the last 35 or 40 years there has been intensive development there? And second, whether it does call into play the question as to the dependability of America as a supplier around the world and not just to Europe.

Professor Cooper, do you have a comment on that?

Mr. COOPER. I agree strongly with the thrust of the question. I think that the use of export controls for foreign policy questions—and this goes beyond the current instance—has the effect of discouraging reliance of foreign or European or Japanese firms on American firms whenever that is possible.

Now, it is a reality that the United State remains the technological leader in many areas of manufacturing, and therefore foreign firms, if they want to stay abreast of technology, will deal with American firms and will continue to do so. But at the margin the effect of this and other foreign policy uses of export controls has the effect of giving Americans a reputation as unreliable suppliers, and therefore, when possible and when it is not too costly, encouraging purchasers to buy European or Japanese goods in preference to American.

I think it will give great impetus to the programs which already exist in many other industrial countries, most visibly in France and Japan, to improve their own technological base. But Britain, Germany, and Italy have such programs as well. These recent actions will give great impetus to other countries to try to establish their technological independence.

As a forecast, my view is that they will not be able to do so entirely. But at the margin, where they can at not too great an expense, they will.

The **Chairman**. Thank you very much.

We have a vote on now. I would suggest to Senator Tsongas that he may want to go down and vote now and come back, and then I will go down and vote so we do not have to recess the hearing.

Dr. Rashish.

Mr. **Rashish**. I would like to cast a dissenting view. I agree that any effect would be at the margin. But I think the effects at the margin would be inconsequential because they are likely to be of consequence only when a foreign company is faced with two equal choices, say, Japanese technology or United States technology, and where all the other attendant circumstances, finance, the other arrangements that go into any kind of sophisticated deal, are equal. Such cases of perfectly equal alternatives do not arise very often.

I think what is likely to happen is that European and Japanese companies that enter into licensing arrangements with American companies will hereafter bridle at inserting the clause which the administration is relying on as the legal basis for the sanctions which the President has applied. That is the clause that says that the licensee will abide by the terms—and I do not know the precise language—but the terms of any action by the executive under the Export Administration Act or some relevant part of it.

Those are in the licensing agreements with General Electric entered into with its European licensees. Now, licensees once burnt, twice shy, might get very shy about signing off on that kind of language in a future license agreement. But I doubt whether it is going to have the kind of chilling effect on business between American and European firms that is suggested by at least the newspaper articles.

The **Chairman**. Mr. Ellsworth, you mentioned previously the joint U.S. offshore drilling project, the Sakhalin project. How does this project differ from the European pipeline, and should Japan have been treated differently in formulating U.S. policy?

Mr. **Ellsworth**. I do not know what project your are referring to, Senator.

The **Chairman**. There is a proposed joint project with the Soviet Union and Japan, is there not?

Mr. **Ellsworth**. Yes.

The **Chairman**. Do you suppose those two projects should be treated differently with respect to sanctions?

Mr. **Ellsworth**. The implication of my statement is that the sanctions in the present instance on the West European gas pipeline are probably in error and probably will not work. They probably will not succeed. I would like to see the United States move beyond those sanctions and begin working on the development of north and south alternative sources for the gas. So I would not think that the sanctions ought to apply to a different project if I do not think that they would be successful in the present instance. I do not know if that answers your question.

The **Chairman**. Fine. Perhaps Professor Cooper could comment on the Sakhalin project as the United States-Japan offshore drilling project. Should that project have been treated differently?

Mr. **Cooper**. I do not know the details of that project. As I understand it, it is a Russian-Japanese project and involves territory which is under Russian jurisdiction. At least the Russians say it is.

But most of the oil which they hope to discover would be sold to Japan.

The way it gets caught up in the current issue is that the United States has pioneered offshore drilling equipment, particularly more sophisticated pieces of equipment, and some United States or U.S.-licensed measuring instruments were to be used in the offshore drilling equipment.

Like Bob Ellsworth, I think it was a mistake. It does unnecessary damage to United States-Japanese relations without commensurate benefits in terms of our overall foreign policy objectives. So I think it was a mistake.

The CHAIRMAN. Mr. Ellsworth, you mentioned the technology lost through espionage as a possible area of allied cooperation. We could use some areas for cooperation. What specific suggestions do you have along this line?

Mr. ELLSWORTH. Well, Mr. Chairman, I have not looked at the numbers recently, but I do not suppose they are too much different from what they were 4 or 5 years ago when I was looking at them. The enormous numbers of Soviets admitted to this country for the purposes of making so-called industrial visitations, the enormous number of Soviet so-called diplomats admitted to this country who, according to all reports, were engaged in, shall we say, nondiplomatic activities, and the extremely limited amount of money and personnel being devoted by the FBI to monitoring the activities of both categories of Soviets.

That is what I had in mind when I wrote this statement. If you like, I would be glad to update myself as far as the numbers are concerned both on the influx of Soviet personnel and on the ability of the FBI to address the problem with adequate amounts of money and personnel and submit it as a supplement to my statement.

But that is what I had in mind. I think that probably the situation is not much improved over what it was a number of years ago. I think that it is an unnecessary giveaway by the United States of both industrial and technological espionage to the Soviet Union.

The CHAIRMAN. I believe the Deputy Director of the Patent and Copyright Office in Geneva at the United Nations is a Soviet. Does this provide him, even though U.N. regulations are that you are an international servant and are not serving the interests of your own government when you are serving the U.N., does this put him into a position where he can spot interesting patents that come in from around the world and be able to focus their espionage on them?

Mr. ELLSWORTH. It does. But I assume that office is open to the public, and if he were not in that administrative position, he or somebody else could gain ready access. So I do not know that it would accomplish a great deal by excluding Soviet citizens from that position. But, of course, our own Patent Office is open to the public, and anyone can go in and examine patents.

What I am talking about goes beyond just studying the documentation provided in patents and patent applications and getting into the engineering and some of the advanced R. & D., as indeed a number of our Soviet industrial visitors were doing, clearly, 4 or 5 years ago in some of our major industrial plants.

The CHAIRMAN. We mentioned several times this morning the tightening up of credit. What specific recommendations do any of you have for resuming a dialog with our allies and reducing credit subsidies to the Soviet Union?

This seems to be a point that we should be able to get unanimity on, that they are not a developing country, they are a fully developed nation. There is no reason for subsidies, although, as I commented yesterday, possibly some of the European countries feel that they are not as competitive as others, therefore they would have to offer concessional credit in order to make their deal more attractive and bid for the business.

Mr. **Ellsworth**. I would say two things on that, Mr. Chairman. One, in a general sense and without reference to the pipeline and without reference to Poland, as I indicated in my introduction, there for many years has been, as it were, competition between the United States on the one hand and most of the Western industrial exporting nations on the other hand as far as credit is concerned. And by and large, our Export-Import Bank is not viewed overseas as being a very important player in the export credit game, simply because of the fact that our policy does not provide for a very big and very active Export-Import Bank in comparison with the German counterpart or the British counterpart and so forth and so on.

So that in a sense, although there has been competition, we have not been very competitive as far as export credits is concerned, for a variety of policy reasons. And that would be something that might be reviewed as far as being more competitive is concerned.

My main point this morning, as far as credit is concerned, is that our ability to provide very large-scale credits is a strategic capability that we have, that we have not really deployed in terms of using it in the dynamics of our strategic dialog with the Soviet Union. I think that is a mistake and now that we have a new situation, that is, the collapse, really the bankruptcy of Poland because Poland is bankrupt, and the only thing that we are doing in response to that so far is permitting our Western banks—and I guess they feel they have no choice—to lend the money to Poland with which it can simply service its existing debt.

It seems to me that if we can protect and isolate our banks from the consequences of doing so, that it is time for us to start the ball rolling on a new strategy of using our ability, our unique ability to provide very large-scale credit, by declaring Poland bankrupt and in default and drawing the Soviets into the picture in that manner.

That is what I would hope we would do on a coordinated basis to include both the Western Europeans and the Japanese.

The **Chairman**. Senator Tsongas, Professor Cooper, I believe, has a response to that same question. I have to go and vote, and I will be right back.

Mr. **Cooper**. I have a different view.

Senator **Tsongas** [presiding]. Would you tell me what the question was, please?

Mr. **Cooper**. The question concerned the use of credits to the Soviet Union and Eastern bloc countries and whether there has not in the past been undue competition in the giving of credits. Senator Percy observed that some countries, in order to compensate for their lack of competitiveness in other dimensions, tended to subsidize official credits.

I would agree with all of that. The only observation that I would make in addition to that, though, is the fact that official credits to East bloc countries are now subsidized does not arise from the fact that these credit terms have not tightened substantially. Their interest rates have gone way up, but market interest rates have gone up even more, though in the last several weeks they have come down again.

This is another source of tension between the Europeans and the Americans. The Americans say export credit agencies ought to be charging market-oriented interest rates. The Europeans respond by saying that would be a more acceptable policy if the market rates made sense, but they do not; you Americans have allowed things to get out of hand.

That is not the main point I wanted to make. Since Bob Ellsworth suggested a policy on Poland—namely, that we ought to position ourselves to declare Poland in default—I would just like to register disagreement with that, on two dimensions. The first is that I think if one looks at this historically, the granting of credits to Eastern Europe—which to be sure came about partly through a competitive scramble—created an option for Eastern European countries which they would not have otherwise had to trade more extensively with the West. To that extent, and within the political limits that the Soviet Union found tolerable, they were able to wean themselves from economic dependence on the Soviet Union.

I believe it is in our long-run interest to encourage pluralism in the East bloc. One way of putting it is that Solidarity would not have come into existence without détente, without the modest liberalization that went with greater trade with the West.

The whole evolution of Poland in the last several years has been of great embarrassment and enormous concern to the Soviet Union. If one takes a long view of our policy—that is to say, not over the last 3 years but over the last 15 years—toward Eastern Europe, I think one has to pronounce it a smashing success. We have succeeded in putting the Soviet Union on the spot. Credits were not the only dimension of that, but they were an important dimension.

When it comes to a declaration of default for Poland, I cannot think of a greater gift that we could give the present regime there. A declaration of default would mean they would find it very difficult to borrow in private credit markets during the coming years. But they are finding those difficulties anyway. The banks are giving as little credit as they think they can get away with and still preserve their balance sheets. A declaration of default by a sovereign nation is analogous to a formal bankruptcy proceeding, in which the fact that the debtor is not going to pay its debts is formally acknowledged and it can write them off—or some fraction of them to be determined in the future when the neogtiations for renewed access to the financial markets take place. That is the history of defaults.

We are in a much stronger position if we do not declare Poland in default but keep it on the string. My judgment is—but here, obviously, judgments may differ—the Soviet Union would not pick up the tab. It would take the view that those crazy Poles went off on their liberalization, got too dependent on the West, had no economic policy, and got themselves into heavy debt, so it is their problem.

That would be the formally proper position to take. I believe it would also be the politically astute position for the Soviets to take vis-a-vis Poland, and other Eastern countries, while perhaps giving Poland some commodity aid at the same time to keep the economy going.

So I think we are better off keeping Poland on the string, so to speak, then giving it a grant of a substantial but unknown write-off of the heavy debt they have to Western countries.

This is all quite apart from the problems that would be posed to the creditor banks, which I think has been exaggerated. We should not fall into the habit of thought of saying our hands are tied because the banking system is so involved in Poland. It is true that some banks are heavily involved in Poland. It is also true, however, that many of the bank debts of Europe are government-guaranteed, so it is not the banks but the governments that are at risk, although there is some private risk there, too. The capital of most of the banks is strong enough to absorb, albeit uncomfortably, a Polish default. But I believe there are foreign policy rather than financial reasons declaring Poland in default.

Senator **Tsongas**. Having heard the Haig view, would you like to reply to the Weinberger view?

Mr. **Ellsworth**. I have a couple of comments on what Dick Cooper has said. First of all, I agree as far as the capital of the banks is concerned, it would not be a great problem, so far as I know, for any of the banks, either the European, and certainly not the American banks, to declare a default.

However, there might be some liquidity problems. But in my statement, I indicate that before this procedure gets started, the governments should position themselves to insulate the banks from any such liquidity problems. And I think that could be done by the governments involved.

However, on Dick Cooper's other main point, which is that it would be better not to declare the Poles in default because as long as we do not declare them in default we have them on the string, that is not the case. It is quite the reverse: as long as we do not declare them in default, they have our banks on the string. Our governments, at least the Government of the United States, is not even involved in the picture. And as far as I know, there are no government policy considerations that have entered into American banks' loans to Poland over the years.

We have a situation where the banks find themselves, because of the bankruptcy of Poland, having to continue to extend credit. Both the American banks and the European banks are now in the position of having to extend credit to a bankrupt in order to prevent the consequences to themselves of default.

Senator **Tsongas**. Is that extension not minimal enough to service what they have? There are no new loans being introduced.

Mr. **Ellsworth**. But there are new loans being introduced in order to provide the Poles with the wherewithal to pay the loans that are due.

Senator **Tsongas**. But that is servicing.

Mr. **Rashish**. To cover the interest serice on the debt.

Mr. **Cooper**. No net new loans.

Mr. **Ellsworth**. It may be relatively small relative to the total amount of Polish debt at the present time, but unless some alternate policy is developed, it is an endless process and we are proving nothing with it. We are subsidizing the continuation.

We are either extending credit to a bankrupt without requiring any adjustment whatsoever in his approach to handling his basic economic problems, or we could theoretically, although the Western banks would not have the power to do so, require the Poles to embark upon an austerity program. Well, neither the Western bank nor, so far as I know, any Western government would have the power either to monitor or enforce any kind of austerity program.

So the banks continue to extend endless credit to prove nothing. I think it is a losing proposition. I do not think that it accomplishes any political purpose.

Senator **Tsongas**. Could you predict the Soviet response?

Mr. **Ellsworth**. I, of course, would not predict the future in any respect, and would not predict the Soviet response. And I think that we would have to take the risk that there might not be a Soviet response for a period of time.

I think it is worth that risk because of the fact that we are proving nothing with our present posture. And should the Soviets choose to respond by engaging themselves financially in support of the Polish situation, then we would have engaged the Soviets in a new form of strategic dialog and would, in fact, have changed the dynamics of our strategic dialog with the Soviet Union and would have involved them economically, as it were, in a meaningful way in the political situation in Eastern Europe, which, by the way, with glory to Solidarity, I do no think that there is any chance of freeing Poland from the grip of the Soviet Union by means of credit policies. I think the best thing we could do is to engage the Soviets responsibly in the economic support of Eastern Europe.

By the way, as I indicated in my statement, it is not just Poland, it is Romania, Czechoslovakia, and to some extent, even the Soviet Union.

Senator **Tsongas**. Let me give Dr. Rashish a chance to respond, and then we will get to the next panel.

Mr. **Rashish**. As I indicated in my statement, we ought ot pursue a policy which discriminates among the Eastern European states. Poland is not in the same position as Hungary, Czechoslovakia, the German Democratic Republic, or Yugoslavia, even least, or Romania, for that matter.

But in respect to Poland, it seems to me that Poland, as has already been said, is in default. It is bankrupt. It has an aggregate external debt of $30 billion. The current service on that debt, both repayment of principal and interest, is in the order of magnitude of $6–$8 billion a year.

There is no way Poland can service that debt. There is no way Poland is going to be able to service that debt for the balance of this decade on present form. It does not seem to me that there is any advantage at all, under present circumstances following December 13, in throwing good money after bad into Poland.

The issue of default, it seems to me, is becoming somewhat irrelevant. I could have seen the uses of default or at least the use of financial leverage at the time of the sanctions that were imposed following the declaration of martial law on December 13. Nothing was done about that at that time.

I think today, given the reality of default and bankruptcy in Poland, whether a formal default is declared or not becomes almost inconsequential. What is consequential is what policy we and the Europeans, both as governments and in terms of the private banks, will pursue in the course of a year as they deal with the question of the service on the Polish debt which is due.

We already know that the banks have agreed to lend back some percentage of the interest service to be paid to them. I think it is on the order of magnitude of 50 percent. Well, that is throwing good money after bad.

It is not an easy issue. The whole umbrella issue, the notion that the Soviet Union would provide an umbrella covering the debt obligations of the satellite states of Eastern Europe, has now been found not to be valid. The application of the denial of loans, which, of course, I would recommend, to Poland presents some very difficult problems of conscience.

We are in the process indirectly, even though the measures are designed to apply to the present government of Poland and the Soviet Union, the consequences really are to punish the people who are suffering from the tyranny that prevails in Poland.

Well, that is kind of difficult. But at the same time, I do not see a way out. I do not see the uses at this time of any large extension of credit.

I do not know whether Bob Ellsworth suggests that the possibility of this kind of carrot might cause the Jaruzelski regime to reintroduce the kind of liberal evolution that took place under Solidarity, to release the Solidarity leaders, to renew the dialog between the church and Solidarity and the state and so on. But I doubt it very, very greatly. I just do not see that kind of leverage being applied through the use of loans. So it is a very difficult situation.

Senator TSONGAS. Thank you.

Thank you, Mr. Chairman.

The CHAIRMAN [presiding]. We want to thank you very much for your stimulating testimony. It has been very helpful. The committee appreciates it very much.

Our final panel will address the implications for U.S. business of our economic policy toward the Soviet Union.

We are pleased to welcome before the committee Alexander B. Trowbridge, president of the National Association of Manufacturers; Dr. Herbert Stein, a senior fellow at the American Enterprise Institute and former chairman of the Council of Economic Advisers, who will address the balance of commercial with national security interests; and Mr. T. A. Dukes, executive vice president of the Ingersoll-Rand Co., a firm with extensive East-West trade interests. Mr. Dukes is accompanied by Mr. Robert Seccombe of Ingersoll-Rand, vice president of the Automated Production Systems Division.

Gentlemen, we are pleased to have you with us. Mr. Trowbridge, we would be happy to have you lead off.

## STATEMENT OF ALEXANDER B. TROWBRIDGE, PRESIDENT, NATIONAL ASSOCIATION OF MANUFACTURERS [NAM], WASHINGTON, D.C.

Mr. TROWBRIDGE. Mr. Chairman, thank you. I have provided a longer statement as well as a copy of a letter which was sent to the President on Wednesday regarding this subject. And I would like to try to summarize our views, if I may.

The principal point, I think, concerning the recent decisions to restrict U.S. goods and technology related to the Soviet gas pipeline project is that basically I think they are confused and contradictory and counterproductive.

There are two major assumptions that lie behind the use of foreign policy controls on exports by the United States. Both the Government and the business community must examine these assumptions very closely during the coming year as Congress debates the reauthorization of the Export Administration Act, expiring on September 30 of next year.

I would like to discuss briefly these assumptions in my testimony today.

The first is that foreign policy controls alter the target nation's policies. I think that studies ranging from U.S. controls on trade with Cuba to U.N. sanctions in Rhodesia indicate that economic sanctions have often imposed significant costs on the target nations, but there is no significant evidence that these costs have resulted in the desired policy changes being sought by the nations imposing the sanctions.

Commonsense suggests that a target nation's response to sanctions depends upon several interrelated and important factors: first, the availability of comparable goods and technology from other sources; second, the ability of the target nation to produce the desired goods or technology by itself; third, the political will in the target nation to resist the sanctions and adjust domestic and international policies accordingly; and fourth, the consistency and determination of the control policies of the nation imposing the sanctions.

In reviewing the recent literature on this subject, I think it is clear that rarely are the preceding factors ever alined to the extent necessary to make a target nation modify its policies as desired. The United States, for example, did not alter the fundamentals of our international policies because of the oil embargo imposed in 1973 by OPEC, in spite of very significant costs which were involved.

The second assumption is that foreign policy control sends a signal to the target nation. There exists a widespread belief that foreign policy controls serve as a valuable symbolic gesture by the United States in demonstrating our national displeasure at the conduct of other nations.

The United States has used foreign policy controls for an increasing variety of reasons over the past half-dozen years, including the advancement of reconciliation in Poland or combating terrorism or expressing national displeasure or protesting human rights violations, protecting regional stability, controlling export of hazardous materials, objecting to racial policies, and reacting to military invasions of other nations.

None of these preceding issues can be considered insignificant. But at what point do we use foreign policy controls to such an extent that they, in fact, become hollow gestures? This is an issue which should receive careful consideration in the debate over the reauthorization of the Export Administration Act in 1983.

The U.S. manufacturing community has watched the expansion of foreign policy controls, especially during the last half-dozen years, with growing concern. These controls have long-term implications for American competitiveness around the world and are not merely short-term inconveniences. Export contracts and licensing agreements of U.S. manufacturing firms often involve commitments for the delivery of goods and technologies years in advance of when a particular transaction eventually takes place.

This long timespan is especially true in the area of captial goods which provided the United States with a surplus of $46 billion in our 1981 trade balance. The ability of U.S. firms to enter into and fulfill long-term contracts is absolutely critical to U.S. international competitiveness. As representatives of the manufacturing community, we can only applaud the view expressed by President Reagan in his August 2 speech on agricultural embargoes when he said, "there must be no question about our respect for contracts. We must restore confidence in U.S. reliability as a supplier."

We can only wonder why this does not apply with equal force to manufactured exports. Thirty percent of the increase in total private sector employment in this country between 1977 and 1980 resulted from manufactured exports. Controls that interrupted trade and commerical relations, therefore, strike at the ability of our econony to grow and to provide employment.

Some of the cases that have been presented to me by NAM members show how U.S. business is being caught up by the latest control regulations. One member has concluded that it cannot ship to France ordinary photographic film that will be used in testing of pipeline equipment going to the Soviet Union.

Another American manufacturer stands to lose a multimillion-dollar contract because its European subsidiary cannot ship common oil supply equipment to the U.S.S.R. An industrial gas producer faces the loss of half a division's profits because of the controls. Another firm in the high-technology field cannot figure out whether its French subsidiary should obey French or United States dictates in fulfilling its contracts with the Soviet Union.

These examples, I think, are probably the tip of the iceberg. The major long-term cost is the harm being done to the credibility of U.S. manufacturers as suppliers and business partners. This is especially true for high-technology firms whose products supposedly provide the greatest leverage in our control policies.

One major semiconductor firm, for example, has told us that it is worried that the precedent being established in the so-called pipeline controls on technology transfer will jeopardize their industry's cross-licensing agreements throughout the world.

This situation is especially disturbing in light of the foreign availability of so many products covered by the control regulations on oil and gas equipment to the Soviet Union. Market positions are established by U.S. manufacturers, often with great difficulty and expense. And when the U.S. Government unilaterally takes U.S. companies out of any particular market, we must watch foreign competitors quickly fill the vacuum with their products when ours are denied.

We recognize that the powers granted to the President under section 6 of the Export Administration Act are very broad. It is equally important to realize that it charges the President to expand U.S. exports to minimize the disincentives to exports caused by our control policies.

We also should point out that it is this administration which committed itself to the reduction of the regulatory burden on business as a key element in revitalizing America's industrial base. We would have expected this commitment to have tempered the use of presidential authority under the act. Instead, we are now confronted with a sweeping extension of U.S. foreign policy regulations.

I think it is fruitless to dissect the legal technicalities of the pipeline controls because it is really a policy issue. But we would like to raise the following major points.

No. 1, we note that the regulations as issued state that appropriate persons and industries were consulted, a requirement of the law. Our discussion with member companies and comments made in a special July 15 meeting of our trade policy committee on this issue indicate a widespread feeling that the consultation that took place was, at best, incomplete and perfunctory. Given the sweeping nature of the regulations and the range of U.S. exports and technology affected, a much broader spectrum of the business community should have been consulted before even the interim regulations were issued.

Second, the June 22 regulations block foreign companies using U.S. technology and foreign subsidiaries of U.S. companies from fulfilling existing contracts to supply oil and gas equipment to the Soviet Union, even if these contracts were concluded long before recent events in Poland.

In short, the retroactive aspects of the December 30 controls on U.S.-origin goods have now been extended to non-U.S.-origin goods. These regulations raise the issue of the extent to which a completed export transaction involving either U.S. technology or U.S. goods can be subject to a new U.S. foreign policy control.

It is clear that the terms of an export administration regulation applied at the time of a particular transaction subjects the foreign buyer to the conditions of the regulations, theoretically, in perpetuity.

We raise the question, however, if there exists adequate statutory basis for claiming that the control regulations in effect at the time of the transaction implies continued U.S. jurisdiction allowing for imposition of new controls at a later date which go beyond the terms of the original contract.

The application of the June 22, 1982, controls to transfers of U.S. technology certainly appears to apply to transfer of technical data regardless of when the transfer was made or whether it was subject to any explicit control regulations beyond the general export license.

We doubt frankly that many foreign firms want to consider themselves, or will be allowed by their governments to become, prospective instruments of U.S. foreign policy simply because technical data they use is exported from the United States under a general license. Any jurisdictional claim by the United States along these lines places a grossly unfair burden on U.S. international commercial transactions involving licenses or other agreements for the transfer U.S. technology.

Third, the U.S. Government through the Export Administration Act asserts certain extraterritorial powers to control foreign subsidiaries of U.S. firms. As a practical matter, U.S. authority in this area is limited to the degree to which other governments will tolerate U.S. foreign policy controls on companies operating in their national boundaries.

This was a lesson we should have learned in the 1965 *Freuhauf* case when the U.S. Government directed the Freuhauf Co. not to allow its French subsidiary to proceed with the sale of truck bodies to China. The impasse over this extraterritorial extension of U.S. control policy was broken only after the French courts placed the Freuhauf subsidiary in receivership. China got the truck bodies.

I think it is crystal clear that European governments have a decided lack of tolerance for the latest U.S. controls. The French and Italian Governments have announced contracts between their firms and the Soviet Union will be honored. Great Britain has taken steps to implement its Protection of Trading Interests Act. West German officials have declared that they expect to proceed toward completion of the pipeline.

We seem to be near the undesired result which you, Mr. Chairman, warned of when you said we must not allow the crisis of the east to trigger a crisis in the West. If each side presses its claim to the fullest, U.S. business will be left in an impossible situation, caught between competing national laws and regulations.

Where do we go from here? The pipeline controls are, in our opinion, bad U.S. trade policy. What makes the situation particularly exasperating is that we know of what it takes to achieve successful control policies. Congress outlined the criteria which should be considered in implementing successful controls back in 1979 when it reauthorized the Export Administration Act.

First, the controls should have a good chance of working if they are to be used. Second, there should be consistency between control policies and other U.S. foreign policy toward the target nation. Third, the reaction of other nations should be considered before imposing controls. Fourth, the impact of controls on U.S. competitiveness must be evaluated. Fifth, we should have the ability to enforce the controls. And sixth, the consequence of not imposing controls should be considered.

If these criteria were only taken more seriously, we would avoid the type of mess in which we now find ourselves. The United States in its latest control policies on oil and gas equipment to the Soviet Union has demonstrated the extent to which our Export Administration Act can be misused in controlling U.S. goods and technology both in this country and overseas.

We recommended in a letter to the President that these controls be withdrawn at the earliest possible date. Yet the fact that the regulations have been issued no matter what modifications or adjustments are made in the future has already damaged U.S. business interests.

I hope that congress will address the issue of how to remove the shadow on U.S. commercial relations that has been cast by our latest control policies. There exists, of course, an opportunity to do so in reauthorizing the Export Administration Act next year.

The act cannot remain a broad untested source of presidential power that hangs over the export of normal U.S. industrial products by private firms. We need to reassure our trading partners that a U.S. company can provide reliable and continuing service without having its ability to perform removed from its control by shifting foreign policy controls.

Mr. Chairman, I have run out of my time. I appreciate the opportunity to express our feeling on this issue.

[Mr. Trowbridge's prepared statement follows:]

## Prepared Statement of Alexander B. Trowbridge

Mr. Chairman, members of the Committee, I am Alexander B. Trowbridge, President, National Association of Manufacturers. I am here today to discuss foreign policy controls on U.S. exports.

The use of such controls to regulate the export of industrial products by private U.S. firms affects the broad spectrum of the U.S. manufacturing community. I am, therefore, pleased to present to you our views on this subject, especially in regard to the latest foreign policy controls on oil and gas equipment to the Soviet Union.

The roughly 11,000 members of the NAM account for approximately 80 percent of U.S. industrial output and 85 percent of U.S. industrial employment. Because the lion's share of U.S. exports are shipped by the larger American companies, almost all of whom are NAM members, it is a fair guess that our members account for an even greater portion of U.S. manufactured exports than of U.S. industrial production. In practical terms, this means that our concern for U.S. international competitiveness is second only to our concern for the strength of the U.S. industrial base. In fact, the two cannot be separated.

The NAM for years has argued for easing the scope and jurisdiction of U.S. export control policies. We have and will continue to support the appropriate use of export controls, because clearly one of the attributes of sovereignty is the power to take actions to protect and further national security interests. Such actions, however, must be related to realistic goals and tempered by practical considerations, including the importance of maintaining stable and reliable commercial relations with the rest of the world. The recent decisions to restrict exports of U.S. goods and technology related to the Soviet gas pipeline project are unfortunately confused, contradictory and counter-productive.

### RATIONALE FOR FOREIGN POLICY CONTROLS

There exist two major assumptions behind the use of foreign policy controls by the United States. Both the Government and the business community must examine these assumptions very closely during the coming year as Congress debates the reauthorization of the Export Administration Act, which expires on September 30, 1983. I would like to discuss briefly these assumptions in my testimony today:

*Assumption No 1: Foreign policy controls alter the target nation's policies.*—Studies ranging from U.S. controls on trade with Cuba to U.N. sanctions against Rhodesia indicate that economic sanctions have often imposed significant costs on the targeted nations. There is no significant evidence, however, that these costs have resulted in the desired policy changes being sought by the nations imposing the sanctions.

Commonsense suggests that a target nation's response to sanctions depends on several interrelated factors:

(1) The availability of comparable goods and technology from other sources.

(2) The ability of the target nation to produce the desired goods or technology by itself.

(3) The political will in the target nation to resist the sanctions and adjust domestic and international policies accordingly.

(4) The consistency and determination of the control policies of the nation imposing the sanctions.

All of these factors play an important role in determining the efficacy of any export control policy. In reviewing the recent literature on this subject it appears that rarely are the preceding factors ever aligned to the extent necessary to make a target nation modify its policies as desired. For example, a 1981 study, "*Economic Sanctions*" by Robert Renwick, former head of the Rhodesia Department of the British Foreign Office, concludes that "when consideration is given to the use of the 'economic weapon,' greater attention should be paid to the effects this is likely to have on the target country. Exaggerated expectations should not be entertained as to the likely economic effects, or the time-scale on which these may be felt; still less as to the probable political results."

In examining the usefulness of economic sanctions, this Committee might want to consider the impact of a recent economic sanction imposed on the United States—namely, the 1973 oil embargo. While the costs of this embargo were significant, did we really buckle under and alter the fundamentals of our international policies because of the embargo? I do not think so. And we should not underestimate the will of other nations under similar circumstances.

*Assumption No. 2: Foreign policy controls send a signal to the target nation.*—There exists a widespread belief that foreign policy controls serve as a valuable symbolic gesture by the United States which demonstrates our national displeasure over the conduct of other nations. Such controls show that we are not going to continue "business as usual."

The symbolic rationale would often appear as the primary basis for deciding on the imposition of economic sanctions. In some cases, in fact, it may be open to question whether the controls are meant more for internal or external purposes. David Lloyd George remarked over the British sanctions against Italy for the 1935 invasion of Abyssinia: "They came too late to save Abyssinia, but they are just in the nick of time to save the Government."

I do not think that U.S. foreign policy controls have propped up any recent Administrations in this country. But I would suggest that we are reaching a point where the use of our foreign policy controls has become almost a standard response in U.S. reaction to many international events. One expert on this subject, Kenneth W. Abbott, Associate Professor, Northwestern University School of Law has coined the phrase "control psychology" to describe the recent trend in U.S. foreign export control policies. Mr. Abbott maintains that, as the use of foreign policy controls become commonplace, "issue-oriented groups in the United States will increasingly call for trade controls, seeing any program of governmental action not including them as insufficient."

The United States has used foreign policy controls for an increasing variety of reasons over the past half dozen years. A list of these reasons includes advancing "reconciliation" in Poland, combating terrorism, expressing national displeasure, protesting human rights, protecting regional stability, controlling export of hazardous materials, objecting to racial policies, and reacting to military invasions of other nations. None of these preceding issues can be considered insignificant. But at what point do we use foreign policy controls to such an extent that they in fact become hollow gestures on our part to very real problems. This is an issue that should receive careful consideration in the debate over the reauthorization of the Export Administration Act in 1983.

## IMPLICATION OF CONTROLS FOR U.S. MANUFACTURING

The U.S. manufacturing community has watched the expansion of foreign policy controls especially during the last half dozen years with growing concern. These controls are more than just a short-term inconvenience for U.S. business. They have long-term implications for U.S. international competitiveness.

Export contracts and licensing agreements of U.S. manufacturing firms often involve commitments for the delivery of goods and technology years in advance of when a particular transaction eventually takes place. This long time span is especially true in the area of capital goods, which provided the United States with a surplus of $46 billion in our 1981 trade balance. The ability of U.S. firms to enter into and fulfill long-term contracts is absolutely critical to U.S. international competitiveness. As representatives of the manufacturing community we can only applaud the view expressed by President Reagan in his August 2nd speech on agricultural embargoes—" . . . there must be no question about our respect for contracts. We must restore confidence in U.S. reliability as a supplier." And we can only wonder why this does not apply with equal force to manufactured exports.

The imposition of any export controls must be evaluated in terms of the cost to U.S. credibility as a reliable trading and business partner. Perhaps at one time, we were in a position to ignore this issue because of our economic strength and relative commercial independence. This is no longer the case. Thirty percent of the increase in total private sector employment in this country between 1977-80 resulted from manufactured exports. Controls that interrupt U.S. trade and commerical relations, therefore, strike at the ability of our economy to grow and to provide employment.

It is from this perspective that I would like to examine the latest regulations on oil and gas equipment exports to the Soviet Union, effective on December 30, 1981 and June 22, 1982.

I have been amazed at some of the cases that have been presented to me by NAM members on how U.S. business is being caught up by the latest control regulations. The controls are so sweeping that one NAM member has concluded that it cannot ship to France ordinary photograph film that will be used in oil testing equipment going to the Soviet Union. Another American manufacturer stands to lose a multimillion dollar contract because its European subsidiary cannot ship common oil supply equipment to the U.S.S.R. An industrial gas producer faces the loss of half a division's profits because of the controls. Another firm in the high technology field cannot figure out whether its French subsidiary should obey French or United States dictates in fulfilling its contracts with the Soviet Union.

These examples represent the tip of the iceberg in terms of the damage being done to the manufacturing community by the latest control policies. The major long-term cost is the harm being done to the credibility of U.S. manufacturers as suppliers and business partners. This is especially true for high technology firms whose products supposedly provide the greatest leverage in our control policies. One major semi-conductor firm, for example, has told us that it is worried that the precedent being established in the so-called pipeline controls on technology transfer will jeopardize their industry's cross licensing agreements throughout the world.

This situation is especially disturbing in light of the foreign availability of so many products covered by the control regulations on oil and gas equipment to the Soviet Union. Market positions are established by U.S. manufacturers often with great difficulty and expense. Foreign competitors are reluctant to take on U.S. companies with established market positions because of the initial startup costs and time involved with such a challenge. When the U.S. Government unilaterally takes U.S companies out of any particular market, we must watch foreign competitors quickly fill the vacuum with their products when ours are denied.

We recognize that the powers granted to the President under Section 6 of the Export Administration Act are very broad. It is equally important to realize that the Act charges the President to expand U.S. exports and to minimize the disincentives to exports caused by our control policies. Above all, we point out that it is this Administration which committed itself to the reduction of the regulatory burden on business as a key element in revitalizing America's industrial base. We would have expected this commitment to have tempered the use of Presidential authority under the Act. Instead, we are now confronted with a sweeping extension of U.S. foreign policy controls which cast a shadow over U.S. commercial transactions, especially in Western Europe.

It is fruitless to dissect the legal technicalities of the pipeline controls. This is a policy issue. We would like to raise the following points about the U.S. policy in this particular case:

(1) Consultation with the business community.

(2) Retroactive application of new controls.

(3) Extraterritorial application to foreign subsidiaries of U.S. companies.

I would briefly like to discuss each of these points.

*(1) Consultation with the business community.*—From the business community's viewpoint, one of the most important elements of the 1979 Export Administration Act is the provision calling for consultation with U.S. industry on the imposition of any foreign policy control. The Act states that affected U.S. industry should be consulted "before imposing export controls" with respect to two specific criteria: first, the efficacy of the proposed controls and, second, their likely effects on U.S. export competitiveness, including "the reputation of the United States as a supplier of goods and technology."

We have attempted to ascertain from our members the degree to which the manufacturing community was consulted on the June 22 regulations. We note the regulations as issued state that "appropriate persons in industry" were consulted. Our discussions with member companies, and comments made in a special July 15 meeting of our Trade Policy Committee on this issue, indicate a widespread feeling that the consultation that took place was at best incomplete and perfunctory. Given the sweeping nature of the regulations and range of U.S. exports and technology affected, a much broader spectrum of the business community should have been consulted before even the interim regulations were issued.

It does little good, furthermore, to claim that these regulations apply only to oil and gas equipment going to the Soviet Union and, therefore, greater industry consultation was not necessary. Our trading partners know only too well that the precedent established today for trade with the U.S.S.R. can be used tomorrow in other commercial transactions with other nations.

*(2) Retroactive application of new controls.*—The June 22 regulations block foreign companies using U.S. technology and foreign subsidiaries of U.S. companies from fulfilling existing contracts to supply oil and gas equipment to the Soviet Union, even if these contracts were concluded long before recent events in Poland. In short, the retroactive aspects of the December 30 controls on U.S. origin goods have now been extended to non-U.S. origin goods.

These regulations raise the issue of the extent to which a completed export transaction involving either U.S. technology or U.S. goods can be subject to new U.S. foreign policy controls. It is clear that the terms of an export administration regulation applied at the time of particular transaction subjects the foreign buyer to the conditions of the regulations, theoretically in perpetuity. We question, however, if there exists adequate statutory basis for claiming that the control regulations in effect at the time of the transaction implies continued U.S. jurisdiction allowing for imposition of new controls at a later date which go beyond the terms of the original contract.

We are aware, of course, that some of the contracts between United States and European firms have various provisions relating to U.S. export controls regulations. We do not know the exact language of these contracts and do not want to speculate on the extent to which foreign firms have or have not agreed to abide by new U.S. export control policies, regardless of the policies of their own governments.

We note a recent statement by West Germany's Minister of Economics on this subject: "The West Europeans are in agreement: the application of the principle of extraterritoriality in U.S. Government decisions is unacceptable to us. It violates our sovereignty. Therefore, we have to reject it. This is the unanimous position in Bonn, London, Paris and Rome—despite the content and clauses in civil law contracts between European and U.S. companies. Such private agreements, the concrete content of which still would have to be examined carefully, cannot and must not alter the legal basis of international relations between states. Above all, they must not retroactively block execution of contracts that were concluded between the European companies and the Soviet Union long before the events in Poland."

The vast majority of U.S. export contracts and licensing agreements, of course, do not have any provisions concerning the application of U.S. export control law. Yet, it seems that the latest regulations are in fact asserting what can only be called retroactive control over such transactions. As an example of this type of control, I would like to draw the Committee's attention to the application of the June 22, 1982 controls to transfers of U.S. technology.

The regulations state that export or reexport of oil and gas equipment to the U.S.S.R. is prohibited if "the U.S. technical data are the subject of a licensing agreement with, or the use of the data is contingent upon royalty payments or other compensation to any person subject to the jurisdiction of the United States as defined in 385.2(e), regardless of when the data were exported from the United States." The preceding provision certainly appears to transfer of technical data involving production of oil and gas equipment regardless of when the transfer was made or whether it was subject to any explicit control regulations beyond a general export license.

We doubt that many foreign firms want to consider themselves, or will be allowed by their governments to become, prospective instruments of U.S. foreign policy simply because technical data they use is exported from the United States under a general license. Any jurisdiction claim by the United States along these lines places a grossly unfair burden on U.S. international commercial transactions involving licenses or other agreements for the transfer of U.S. technology.

*(3) Extraterritorial application to foreign subsidiaries of U.S. companies.*—The U.S. Government through the Export Administration Act asserts certain extraterritorial powers to control foreign subsidiaries of U.S. firms. Presidential authority in this instance derives from an amendment to the Export Emergency Economic Powers Act. The language contained in the amendment is very broad, providing "authority for control over exports of non-origin U.S. goods and technology by foreign subsidiaries of U.S. concerns."

The legislative history of this amendment reveals more than a little confusion over what powers Members of Congress thought they were granting the President.

The principal House sponsor of the amendment stated that it was intended to ensure that the President had authority to maintain existing controls on foreign subsidiaries of U.S. companies. In 1977, such controls were limited to exports to embargoed nations and exports of strategic goods to Communist nations.

The Senate Banking Committee in passing the 1979 Export Administration Act considered this matter and decided not to take any action to limit Presidential power "pending further study of the issue." The Committee noted that the possible application of U.S. foreign policy controls to foreign subsidiaries of U.S. companies in "non-emergency situations may not have been considered adequately by the Congress at the time the provision was adopted." It is our view that the concerns of the Banking Committee over this extraterritorial application of foreign policy controls were not misplaced.

As a practical matter, U.S. authority in this area is limited by the degree to which other governments will tolerate U.S. foreign policy controls on companies operating in their national boundaries. This was a lesson we should have learned in the 1965 *Fruehauf* case when the U.S. Government directed the Fruehauf Company not to allow its French subsidiary to proceed with a sale of truck bodies to China. The impasse our this extraterritorial extension of U.S. control policy was broken only after the French courts placed the Fruehauf subsidiary in receivership. China got the truck bodies.

The reaction of European governments suggests a decided lack of tolerance for the latest U.S. controls. The French and Italian governments have announced that contracts between their firms and the Soviet Union will be honored. Great Britain has taken steps to implement its Protection of Trading Interests Act. West German officials have declared that they expect to proceed toward completion of the pipeline.

If each side presses its claim to the fullest, U.S. business will be left in an impossible situation—caught between competing national laws and regulations.

## WHERE DO WE GO FROM HERE

The pipeline controls are bad U.S. trade policy. What makes the situation particularly exasperating is that we know what it takes to achieve successful control policies. Congress outlined the criteria that should be considered in implementing successful controls in 1979 when it reauthorized the Export Administration Act:

(1) Controls should have a good chance of working if they are to be used.

(2) There should be consistency between control policies and other U.S. foreign policies toward the target nation.

(3) The reaction of other nations should be considered before imposing controls.

(4) The impact of controls on U.S. competitiveness must be evaluated.

(5) We should have the ability to enforce the controls.

(6) The consequences of not imposing controls should be considered.

If these criteria were only taken more seriously, we would avoid the type of mess in which we now find ourselves. But Congress in 1979 did not make the criteria for foreign policy controls stick; as a practical matter, the Executive Branch needs to do little more than give them minimal attention.

The United States in its latest control policies on oil and gas equipment to the Soviet Union has demonstrated the extent to which our Export Administration Act can be misused in controlling U.S. goods and technology both in this country and overseas. We have recommended in a letter to the President (copy attached to statement) that these controls be withdrawn at the earliest possible date. Yet, the fact that the regulations have been issued, no matter what modifications or adjustments are made in the future, has already damaged U.S. business interests. The U.S. has shown how far our foreign policy controls can be pushed.

Congress must address the issue of how to remove the shadow on U.S. commerical relations that has been cast by our latest control policies dealing with the Russian pipeline. There exists, of course, an opportunity to do so in reauthorizing the Export Administration Act next year. The Act cannot remain a broad untested source of Presidential power that hangs over the export of normal U.S. industrial products by private firms. We need to reassure our trading partners that a U.S. company can provide reliable and continuing service, without having its ability to perform removed from its control by shifting foreign policy controls. Proponents claim that our control policies are necessary to demonstrate we will not "continue business as usual." After the last half dozen years of foreign policy controls, it would be good if this country's commercial policies could allow a return to "business as usual."

We must recognize the limitations inherent in the unilateral application of our foreign policy controls. Congress could provide guidance in this area in a number of ways, ranging from tighter drafting of the foreign policy control provisions in U.S.

law to the outright prohibition of the use of these controls without agreement with our allies regarding their scope and content. It is possible that we should consider individual statutory authority for any new foreign policy controls in non-emergency situations. These and other alternatives should be considered by Congress in hearings on the reauthorization of the Export Administration Act.

I want to thank you for allowing me to testify today. I would naturally be very willing to answer any questions.

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National Association of Manufacturers,
*Washington, D.C., August 11, 1982.*

The President,
*The White House,*
*Washington, D.C.*

Dear Mr. President: I am writing to express our exasperation and concern over the Administration's export control regulations on oil and gas equipment exports to the Soviet Union. NAM's Trade Policy Committee met in a special session on July 15 to consider these regulations, especially those issued in June. The issues raised in the regulations, which are so troubling to the business community, go directly to the heart of U.S. commercial policy. We believe that from a trade policy point of view, they are confusing, contradictory and counterproductive.

The controls were issued, of course, for the stated purpose of advancing "reconciliation in Poland." It is very doubtful to us, however, if achievement of this objective lies in testing the limits to which Western European nations will tolerate sweeping, extraterritorial extensions of U.S. foreign policy controls. As Senator Percy has said, "We must now allow the crisis of the East to trigger a crisis in the West." But we seem to be near that undesired result.

The U.S. business community for years has argued for easing the scope and jurisdiction of U.S. export policies. The NAM has and will continue to support the appropriate use of export controls, because clearly one of the attributes of sovereignty is the power to take actions to protect and further national security and foreign policy interests. Such actions, however, must be related to realistic goals and tempered by practical considerations, including the importance of maintaining stable and reliable commercial relations with the rest of the world.

The imposition of export controls must be evaluated in terms of the cost to U.S. credibility as a reliable trading and business partner. Perhaps at one time, we were in a position to ignore this issue because of our economic strength and relative commercial independence. This is no longer the case. Thirty percent of the increase in total private sector employment in this country between 1977–80 resulted from manufactured exports, so controls that interrupt U.S. trade and commercial relations strike at the very ability of our economy to grow and to provide employment. This situation is especially disturbing in light of the foreign availability of so many products covered by the control regulations on oil and gas equipment to the Soviet Union. We now must watch foreign competitors quickly fill the vacuum with their products when ours are denied.

This Administration made a commitment to the reduction of the regulatory burden on business as a key element in revitalizing America's industrial base. We would have expected this commitment to have tempered the use of the admittedly broad Presidential authority under the Export Administration Act. Instead, we are now confronted with a sweeping extension of U.S. foreign policy controls which cast a long shadow over U.S. commercial transactions, especially in Western Europe.

We are primarily disturbed by the following points:

*(1) Consultation with business community.*—We have attempted to ascertain from our members the degree to which the manufacturing community was consulted on the June 22 regulations. We note the regulations as issued state that "appropriate persons in industry" were consulted. Our discussion with member companies, and comments made in the July 15 meeting of our Trade Policy Committee, indicate a widespread feeling that the consultation that took place was at best incomplete and perfunctory. Given the sweeping nature of the regulations and the range of U.S. exports and technology affected, a much broader spectrum of the business community should have been consulted before the regulations were issued.

*(2) Application of controls to technology transfer.*—The new regulations raise an enormous question mark over the application of U.S. foreign policy controls to the transfer of U.S. technical data. The regulations appear to apply to transfer of technical data involving production of oil and gas equipment regardless of when the transfer was made or whether it was subject to any explicit control regulations beyond a general export license.

We doubt that many foreign firms want to consider themselves, or will be allowed by their governments to become, instruments of U.S. foreign policy simply because technical data they use is exported from the U.S. under a general license. Any jurisdictional claims by the U.S. along these lines place a grossly unfair burden on U.S. international commercial transactions involving licenses or other agreements for the transfer of U.S. technology. We doubt that the U.S. government would welcome an equivalent extension of foreign power over investments in the U.S.

*(3) Retoactive application of new controls.*—The June 22 regulations block foreign companies using U.S. technology and foreign subsidiaries of U.S. companies from fulfilling existing contracts to supply oil and gas equipment to the Soviet Union, even if these contracts were concluded long before recent events in Poland. In short, the retroactive aspects of the December 30 controls on U.S. origin goods have now been extended to non-U.S. origin goods.

These regulations raise the issue of the extent to which a completed export transaction involving either U.S. technology or U.S. goods can be subject to new U.S. foreign policy controls. It is clear that the terms of an export administration regulation applied at the time of a particular transaction subject the foreign buyer to the conditions of the regulations, theoretically in perpetuity. We question, however, if there exists adequate statutory basis for claiming that the control regulations in effect at the time of the transaction implies continued U.S. jurisdiction allowing for imposition of new controls at a later date which go beyond the terms of the original contract.

It does little good to claim that the retroactive controls under question apply only to oil and gas equipment going to the Soviet Union. Our trading partners know only too well that the precedent established today for trade with the U.S.S.R. can be used tomorrow in other commercial transactions with other nations. The same principle that you enunciated in Des Moines on August 2nd, when you said ". . . there must be no question about our respect for contracts. We must restore confidence in U.S. reliability as a supplier", applies equally to this case as it does our agricultural trade. But how can a U.S. manufacturer clearly assure reliable and continuing contract fulfillment when its ability to perform may be removed from its control?

*(4) Extraterritorial application to foreign subsidiaries of U.S. companies.*—The U.S. government through the Export Administration Act asserts certain extraterritorial powers to control foreign subsidiaries of U.S. firms. As a practical matter, however, U.S. authority in this area is limited by the degree to which other governments will tolerate U.S. foreign policy controls on companies operating within their national boundaries. The reaction of European governments to date suggests a decided lack of tolerance for the latest U.S. controls. They warned that there would be a reaction, and it has indeed been a determined one.

The French and Italian governments have announced that contracts between their firms and the Soviet Union will be honored. Great Britain has taken steps to implement its Protection of Trading Interests Act. West German officials have declared that they expect to proceed toward completion of the pipeline.

If each side presses its claim to the fullest, U.S. business will be left in an impossible situation—caught between competing national laws and regulations.

We urge you to withdraw the regulations that went into effect in December and June at the earliest possible date. We also recommend that the issues raised in this letter be fully reviewed by the Executive Branch, Congress and the business community with the aim of reducing the significant damage that U.S. foreign policy controls have had on U.S. business credibility. Foreign policy controls cannot be extended in the manner proposed by the latest regulations without causing so much damage as to make the United States lose more than it gains.

Sincerely yours,

ALEXANDER B. TROWBRIDGE.

The CHAIRMAN. I appreciate that very much. It has been 16 years since I have been a manufacturer, but I see I am not out of tune with the thinking that has been expressed here by my former colleagues in business. I concur completely with the conclusions you have come to. And that is after 16 years in public life.

The views have not changed at all. I just do not see the relevance of many of these policies that we have implemented to the present problems that we have.

Dr. Stein.

## STATEMENT OF HERBERT STEIN, SENIOR FELLOW, AMERICAN ENTERPRISE INSTITUTE, WASHINGTON, D.C.

Mr. STEIN. Mr. Chairman, I am pleased to have this opportunity to present my views on the economic significance for the United States of trade with the Soviet bloc and of the use of that trade as an instrument of U.S. national security policy. I regard the subject as important because there is danger that mistaken ideas about it will prevent the United States from taking steps that would promote its security.

Everything that needs to be said on this subject can be said in a few words. U.S. trade with the Soviet bloc—whether we have it or do not have it, whether we interrupt it in whole or in part, or make it contingent on political events—is of trivial economic consequence to the United States. If there is anything we can do with this trade that is of even slight value to the U.S. security or U.S. foreign policy, we should not be deterred by fear that it will damage the U.S. economy significantly.

This proposition might seem obvious enough from the fact that in the past few years U.S. exports to the Soviet Block ranged from one-eighth to one-fifth of 1 percent of U.S. GNP and U.S. exports to the Soviet Union itself were about one-tenth of 1 percent of the U.S. GNP. Nothing we do with such magnitudes is likely to have a big effect on our economy. But, in fact, even these trivial numbers give an exaggerated impression of the effect, for good or ill, of this trade on the U.S. economy.

This may seem a shocking thing to say. I can imagine that if the president of the XYZ Corp. was told that he could not accept an order for $100 million from the Soviet Union he would say that he had been significantly hurt. He might even be right. But the point is that there is a big difference between the XYZ Corp. and the United States. The sale by XYZ Corp. to the Soviet Union is not the end of the story. The XYZ Corp. wants to be paid. It can extend credit to the Soviets and borrow in the United States to finance this sale. This raises U.S. interest rates, depresses investment in the United States, and drives some American capital goods producer or homebuilder out of business. The Soviet Union may pay for its purchase from the XYZ Corp. by selling something to the United States. That means that Americans are buying from the Soviet Union instead of buying the same thing or something else from American producers. Those American producers lose business. The Soviet Union may sell gold to acquire dollars in order to pay for what it bought from the XYZ Corp. In that case the exchange rate of the dollar rises and American exporters lose business.

The essential point is that the American economy is a vast, tightly interconnected system. A change initiated at one point has repercussions throughout the system. You cannot know the effects of a single impact upon the economy until you have traced it throughout the system. The most general conclusion of economics is that changes impinging on one unit of the system, like the orders of the XYZ Corp., will tend to generate offsetting changes elsewhere, so that the total level of business or of economic activity will be unchanged.

Of course, the distribution of business will be affected if the Government prevents the XYZ Corp. from doing $100 million worth of business with the Soviet Union, although the loss even to them will be much less than $100 million. They will make themselves heard. But all the other American businesses who will lose if the XYZ Corp. gets the Soviet contract will not be heard. They will never know what happened to them.

In recent statements to the Joint Economic Committee, the Departments of State, Commerce, and Treasury separately estimated that in 1980 U.S. exports to the Communist countries supported 300,000 American jobs, or three-tenths of 1 percent of all American jobs. The Treasury estimates excluded exports to Communist China whereas State and Commerce estimates included Communist China. This, however, is a trivial discrepancy which need not divert us. The estimate is worthless. The estimate assumes that U.S. GNP is higher by the amount of U.S. exports to the Communist countries. That is certainly not the case. The best estimate is that U.S. exports to the Communist countries do not increase employment in the United States at all—not even by three-tenths of 1 percent.

One can imagine circumstances in which exports to the Soviet bloc would increase total employment in the United States. These are rather unusual circumstances. But if they do exist they are also the circumstances in which employment can be increased by increasing Government spending, cutting Government taxes, or increasing the money supply. Total U.S. exports to the Soviet bloc in a year are less than Congress spends through the Federal budget in 2 days. The U.S. Government can do as much for total employment by a flick of the wrist as is done by our total exports to the Soviet bloc.

The effect on our economy of trade with the Soviet bloc, or of any foreign trade, is not to be measured in terms of total employment or total economic activity. It is to be measured by the efficiency with which we use our resources. We use a certain amount of labor and capital in producing for export. What we get for this use of our labor and capital is the imports we obtain in exchange. Our gain from this trade is the excess of the value to us of the imports over the value to us of using those resources to produce for domestic consumption. If we think of the total trade the gain to us may be a fairly large fraction of the total value of the trade because there are many things we import from the rest of the world that we could produce at home in similar quantities, but at much greater cost: Oil, coffee, bananas, for example. But if we think of the trade with only one area, like the Soviet bloc, the gain to us from trading with them is much less, relative to the volume of trade, because we have the option not only of producing for ourselves but also of importing from someone else.

We produce soft drinks which we sell the Soviet Union from whom we buy vodka. Our gain from this trade is the excess of the value of the vodka we get over the value of the vodka we could produce in New Jersey, buy from Turkey, or from any of the other places where vodka might be produced. We should measure the possible gains or losses to the United States of trading or not trading with the Soviet bloc by looking at the volume and composition of our imports from them and asking what is the value to us of those imports as compared with alternative supplies. I believe that the value to us in these terms is trivial.

It is probably true that the adverse effects of interrupting trade with the Soviet Union is greater than the adverse effects of never having done the trade at all. Particular American firms might have made investments that they would not have made, and they would have losses that they would not have suffered, if they had not counted on the Soviet business. Since the total volume of the trade is small, and the special uncertainties of the trade are unknown, these losses are unlikely to be large. In any case, the way to deal with that problem is not to be inhibited from interrupting such trade where we think the national security would be advanced by doing so. The U.S. Government should make clear that it reserves the right to control trade with the Soviet Bloc in the interest of our national security. This will put American businesses on notice of the risks of engaging in such trade, which will not prevent them from doing it but will deter them from doing it unless they get a return which compensates them for the risks. I have suggested elsewhere that if this is a big problem, the Government might establish something like trading-with-the-enemy insurance. I do not, however, consider it a big problem.

You have not asked me here to comment on the national security consequence of trading with the Soviets or not trading with them. Of course, that is the key question, and I want to volunteer my opinion on that nonetheless. I believe that the Soviet Union is our enemy and that trading with them is trading with the enemy. They are our enemy because our freedom and prosperity is a threat to their system. They will try to suppress us and they will use the resources they have to try to do that. Their threat to us will be greater the greater are their resources. There is no economic gain to us from trading with them that would make it worthwhile for us to increase their resources by such trade. There may be political or security benefits to us that would make such trade worthwhile. The hope for such benefits was the rationale for détente. Events seem not to have justified this hope. This does not preclude the possibility that trade could be an element in a more secure relationship with them in the future, but the specific terms of that relationship would have to be examined carefully and skeptically. Thank you.

The **Chairman**. Thank you very much, Dr. Stein.

Mr. Dukes.

## STATEMENT OF T. A. DUKES, EXECUTIVE VICE PRESIDENT, THE INGERSOLL-RAND CO., ACCOMPANIED BY ROBERT J. SECCOMBE, VICE PRESIDENT, AUTOMATED PRODUCTION SYSTEMS DIVISION, WOODCLIFF LAKE, N.J.

Mr. **Dukes**. Mr. Chairman, members of the committee, I am Thadeous Dukes, executive vice president of the Ingersoll-Rand Co. First of all, I would like to thank you for having us here today and for your invitation for us to appear and describe the impacts that the President's export restrictions have had on our company. I am accompanied by Bob Seccombe, who is the vice president of the Automated Production Systems [APS] Division of Ingersoll-Rand.

Mr. Seccombe is intimately familiar with the problems that have arisen because of these restrictions and will present our testimony today.

Furthermore, I am happy to have him with me today because I picked up this head cold in Nantucket last weekend, and I doubt very much that my voice would hold up for 10 minutes.

Bob.

Senator TSONGAS. Would you tell us what your button says? I cannot read it here.

Mr. SECCOMBE. It says, "Say Yes to Michigan."

Senator TSONGAS. I have never said anything else. [General laughter.]

Mr. SECCOMBE. Mr. Chairman, members of the committee, I, like Mr. Dukes, appreciate the opportunity to appear here. The APS Division of Ingersoll-Rand is a world leader in the production of assembly and test equipment for the automobile and truck drive train industry. We have prepared a written statement which has been submitted for your review. I would now like to take a few minutes to summarize the problems presented therein.

During the course of these hearings there has been considerable discussion concerning the merits and direct impacts of restrictions on exports to the Soviet Union. The impact these restrictions are having on business has been described quite graphicially.

Ingersoll-Rand has also had specific export restrictions imposed upon it. In May 1980, just 4 days prior to shipment, the Department of Commerce issued interim regulations prohibiting Ingersoll-Rand from exporting an engine assembly line to the Kama River truck assembly plant in the Soviet Union.

This same canceled contract has since been awarded to the Comau division of Fiat of Italy. Incidentally, Comau has since approached Ingersoll-Rand earlier this year and asked if we would participate as a subcontractor to them on this project.

We appear before you today, however, not to discuss the merits of these or other restrictions that might be imposed when the President decides that paramount national security interests are involved. Rather, our purpose is to described what we believe are some unintended consequences that Ingersoll-Rand and other American businesses are facing as a result of the restrictions that which were invoked in 1980.

We are also prepared to offer a proposal that will go a long way in resolving these unintended inequities and thus create a climate whereby American companies can participate on a more equal basis with foreign competitors on those projects which are not restricted by the U.S. Government.

As we understand it, our Government policy remains one of permitting, if not actually encouraging, appropriate trade with the Soviet Union and Eastern bloc countries. Yet Ingersoll-Rand finds itself all but precluded from these markets even for products not covered by export restriction.

This is because uncertainty over U.S. export policy has made it impossible for companies like ourselves to obtain political risk insurance. The private insurance industry which in the past offered political risk insurance covering action by the U.S. Government has now refused to offer it as a result of unpredictable U.S. export policy.

This is not surprising when one considers the following: When Ingersoll-Rand entered into the Kama River contract, which incidentally was an exact duplicate of another contract which we fulfilled in 1975, we were told repeatedly that the Government had no objection. Nevrtheless, restrictions were imposed within 4 days of shipment, and the insurance companies had to pay partial compensation to Ingersoll-Rand pursuant to its insurance policies because no other market exists for the same of the machinery involved.

More recently, Ingersoll-Rand has been offered substantial contracts by the Soviet Union and East Germany for assembly and test systems which are not subject to any export restriction. In an attempt to alleviate the private insurance company's concern, Ingersoll-Rand sought a degree of Government insurance that present policy would not change and that we would be permitted to export the products as scheduled if we were awarded a contract.

The response demonstrates the very substantial dilemma we face. In November 1981 we wrote to Secretary Baldrige requesting that the Department of Commerce advise us that the equipment involved could be shipped under a general destination license and that such license would not be revoked prior to completion of shipment.

Secretary Baldrige responded that the equipment in question could indeed be shipped under a general destination license. But he also stated, as expected under existing circumstances, "Unfortunately, I am unable to provide you with specific assurances over any particular time period because this license classification determination can only reflect our current policy in a very sensitive trade area."

Obviously, the Secretary retained the right to impose further restrictions. In effect, Ingersoll-Rand and the insurance companies are forced by Government policy to play Russian roulette if they intend to remain in the market.

Rather than take these risks, the private insurance companies have refused to offer political risk insurance for exports to the Eastern bloc. The immediate result is that APS lost all of these potential contracts to European competitors in the third and fourth quarters of last year, and most certainly will lose future projects if a solution to the problem is not immediately forthcoming.

The two projects which I have mentioned involved a total of 380 man-years of work. We are confident that Ingersoll-Rand would have been successful and received contracts involving at least 183 man-years of work on these projects.

Since the first of this year our operation in Farmington Hills, Mich., just outside the city of Detroit, has been forced to lay off 133 Ingersoll-Rand employees and 256 contractors that would have been involved in these projects.

The inability to obtain political risk insurance is not a problem that hinders our competitors in Italy, France, Germany, Canada, and the United Kingdom, where the governments have established programs of political risk insurance which protect exporters against government-imposed trade restrictions. These governments have recognized the problem private industry is faced with when export restrictions are used as a tool of foreign policy.

I might mention that the availability of Government-sponsored political risk insurance in these countries creates a dilemma for companies like ours which have plants of our own or own subsidiaries in these other countries. Ingersoll-Rand, for example, could manufacture nonrestricted products for export to the Soviet Union in its plants in either Canada or Europe and receive Government-sponsored political risk insurance protection.

But if we do this, we are not providing jobs at our domestic plants. We have now lost major contracts on two projects because we were determined to manufacture on two projects because we were determined to manufacture the equipment in the United States. How long can we postpone making a decision to produce the equipment elsewhere?

Presently, the Soviet Union and other Eastern bloc countries are offering substantial contracts to American companies. They involve products that may be shipped without specific approval from our Government. But without political risk insurance, Ingersoll-Rand and companies like ourselves are simply unable to accept the risks that these multimillion-dollar contracts might be embargoed after enormous amounts of working capital have been invested.

We appear before you today seeking your immediate assistance. Ingersoll-Rand, like many other American manufacturers, definitely desperately needs to be able to participate in all markets that have not been foreclosed by current export restrictions. We ask that the Government recognize the impact of its restrictive policies and provide an insurance program through an agency such as OPIC which will protect industry against changes in export policy so that we can again compete on an equal basis in the international marketplace and keep Americans working.

The predictable costs of taking this governmental action is relatively small. The inevitable cost to the American economy of failing to do so is quite large. Thank you.

[Mr. Dukes' and Mr. Seccombe's prepared statements follow:]

### Prepared Statement of T. A. Dukes and Robert J. Seccombe

Mr. Chairman, Members of the Committee: I am Robert J. Seccombe, Vice-President of the Automated Production Systems Division (APS) of the Ingersoll-Rand Company. Appearing with me is Mr. T. A. Dukes, Executive Vice-President of Ingersoll-Rand. The APS Division of Ingersoll-Rand is a world leader in the production of automated systems for the assembly and testing of automobile and truck drive train components. Our equipment is installed in all of the major automobile and truck assembly plants in the United States and many others throughout the world. We greatly appreciate your invitation to appear before the Committee to discuss the impact the President's restrictions on exports to the Soviet Union have had on our company.

At the outset we would like to make clear that the Ingersoll-Rand Company is not appearing here to challenge the President's authority to impose appropriate restrictions on exports to any country when paramount national security and foreign policy interests are involved. We respect and will, of course, fully honor the President's existing authority under the Export Administration Act to restrict access to advanced American technology or militarily significant or strategic goods. Our purpose is only to describe what we believe are the unintended consequences for American business of the restrictions and to seek your aid in enabling American industry to continue participating as a viable competitor on projects that have not been restricted.

As we understand it our Government's policy remains one of permitting, if not actually encouraging, appropriate trade with the Soviet Union and Eastern Bloc countries to improve our balance of payments, promote competition in foreign markets, and maintain jobs for American workers. Yet Ingersoll-Rand finds itself all but precluded from these markets, not because all or most of its products are covered by export restrictions, but because uncertainty over United States export policy has made it impossible for American companies to obtain political risk insurance in the private market to protect against any future restrictions that conceivably could be imposed.

While we know this problem is not unique to Ingersoll-Rand, our recent experience serves as a graphic illustration of the unintended impact of the present export restrictions. I believe a brief history of Ingersoll-Rand's difficulties in the export market over the last several years will put this problem into perspective. In 1975, Ingersoll-Rand with United States Government encouragement and approval, exported an automated engine assembly line to the Soviet Union for installation at the Kama River Truck Plant. Ingersoll-Rand obtained this contract in competition with Italian, French, and German manufacturers. The order Ingersoll-Rand received was only a part of the $600–$800 million worth of contracts received by American companies for this Kama Project.

In the fall of 1978 Ingersoll-Rand was asked to manufacture a duplicate engine assembly line for Kama River. At that time, the product could have been shipped under a General Destination license without specific approval of the United States Government. In fact the technology involved in the requested assembly line was outdated by American standards and readily available from a variety of European producers. Completely satisfied with Ingersoll-Rand's earlier work, however, the Soviets did not approach our European competitors for bids and instead, let a single source ten million dollar contract to Ingersoll-Rand. As a part of the negotiations the Soviets did request assurance that an export license would be granted and the applicability of a General Destination license was confirmed by the Department of Commerce.

During production, over the next year, Ingersoll-Rand had repeated contacts with the Departments of Commerce and Defense concerning the proposed sale. Written assurances were received that a General Destination license was available, and no objections were ever raised that the U.S. Government had any reservations about permitting the shipment for national security or other resources. Yet in a last minute reversal of policy this duplicate system was embargoed in May of 1980 for foreign policy reasons only four days prior to shipment as the result of the alleged use of Kama-built trucks in the Soviet invasion of Afghanistan. The assembly line in question, too big to be cut up as scrap and without a potential market because it was designed specifically for Kama River, is now sitting in a warehouse.

Subsequent to the imposition of the restrictions, Ingersoll-Rand conferred with Department of Commerce officials and others, raising the probability that the Soviet Union could build the assembly line itself or would merely solicit bids from European competitors such as Comau a division of Fiat. The restrictions were retained, however. Ingersoll-Rand then sought the cooperation of the Soviets and asked that the contract be extended in the hope that the United States and Soviet Union would be able to resolve their differences expeditiously. In December of 1981, Ingersoll-Rand finally requested that the contract be cancelled and the Soviets agreed.

In April of this year Ingersoll-Rand received an inquiry from the Comau Division of Fiat of Italy requesting that Ingersoll-Rand serve as a subcontractor on an engine assembly line project that, upon investigation, turned out to be the Kama River project. As predicted, the Soviet Union had turned to our European competitors and chose the Comau Division. While Ingersoll-Rand was disturbed that its prediction had proven true, it was also interested in participating, even if only as a subcontractor, because the engine assembly line would be produced at its plant in Farmington, Michigan, a suburb of Detroit, which, because of the depressed United States economy, was considering the release of up to 250 employees. Eager to generate much needed business, Ingersoll-Rand made contact with the U.S. Government to determine whether its participation as a subcontractor would be permitted but, again, the answer was no. Accordingly, we were forced to turn this business away. As a result not only were United States labor hours transferred to Italy, but it established a new competitor for this type product that until this time had not existed.

We relate this experience to you not because we seek to lift the restrictions on the Kama River Project but because of the negative and we believe unintended impact it and other trade restrictions imposed by the President have had on the ability of American companies to participate in non-restricted trade with the Soviet Union and its Eastern Bloc partners. Despite the imposition of embargoes preventing completion of past contracts, we continue to receive requests for the Soviet Union and other Eastern Bloc countries for bids on substantial new projects. For instance in late 1981 we received a request from East Germany ("GDR") to bid on an assembly system for a commercial vehicle assembly plant constituting a potential $20 million contract. In addition the Soviet Union requested bids on an assembly line for the Togliattigrad automobile assembly plant, a $40 million contract. We believe that, notwithstanding the risk of further embargo, Ingersoll-Rand has been approached on these projects because it offers a superior quality project at a highly competitive price.

Although the assembly lines for both these projects could be exported without specific Government approval pursuant to a General Destination license, Ingersoll-Rand has had to forego participating in them. The reason is that the private insurance industry which in the past offered political risk insurance covering action by the U.S. Government preventing exports by American companies to the Soviet Union and Eastern Bloc countries now refuses to offer it. We believe this has occurred as a result of uncertainty over United States export policy which is considered to be unpredictable if not arbitrary. The insurance companies are simply unable to assess the risk of further selective trade restrictions and, therefore, declined to offer insurance when we contacted them. Given the nature of this equipment and the absence of any other market we could not risk taking the orders without political risk insurance.

This is not surprising. Looking back at the Kama River Project, for which we did have political risk insurance, we were told repeatedly that the Government had no objection to the project and that the assembly line could be shipped without specific Government approval. Nevertheless restrictions were imposed within days of shipment and the insurance companies have had to pay partial compensation to Ingersoll-Rand pursuant to its insurance policies because no other market exists for the sale of the machinery involved.

Our latest efforts to obtain a degree of Government assurance in relation to the Togliattigrad and East German Projects described above, in an attempt to satisfy the insurance companies' concerns, demonstrates the very substantial dilemma we face. In November of 1981, we wrote to Secretary Baldrige requesting that the Department of Commerce adivse us "that the equipment being quoted for GDR and Togliattigrad may be shipped under a General Destination license and that such license will not be revoked prior to completion of shipment." Secretary Baldrige responded that the equipment in question could indeed be shipped under a General Destination license. But he also stated that "unfortunately, I am unable to provide you with specific assurances over any particular time period because this license classification determination can only reflect our current policy in a very sensitive trade area."

Obviously the Secretary retained the right to impose future restrictions. In effect, Ingersoll-Rand and the insurance companies are forced by Government policy to play Russian roulette if they remain in the market. Rather than take these risks, the private insurance companies have refused to offer political risk insurance for exports to the Eastern Bloc. The immediate result is that APS lost all of these orders to European competitors and most certainly will lose future projects if a solution to the problem is not immediately forthcoming. Without this insurance Ingersoll-Rand is simply unable to accept the potential risk involved in a multi-million dollar order of its products.

The inability to obtain political risk insurance is not a problem that hinders many of our competitors, particularly those in Italy, France, Germany and Canada where the governments have established programs of political risk insurance which protect exporters against government imposed trade restrictions. These governments have recognized the dilemma companies find themselves in when export limitations are utilized as a tool of foreign policy. Recognizing that the manufacturers and the private insurance industry will find it all but impossible to assess the political risks involved, the governments have stepped in to fill the void. These governments apparently recognize that, if they are going to utilize export restrictions as a tool of national policy, they must accept responsibility for the negative effect this policy has on business. These are not government hand-out programs. They are simply a recognition that at times government policy can have serious impact on a company's ability to participate in the market.

Indeed the availability of government sponsored political risk insurance in these countries creates something of an anomaly when American companies like ours have plants or own subsidiaries in these other countries. Ingersoll-Rand, for instance, could manufacture the equipment for the Togliattigrad and GDR projects in plants in either Canada or Europe and receive government sponsored political risk insurance. But if we do this we are not providing jobs at our domestic plants but are adding to already high unemployment in areas such as Detroit while increasing employment in these other countries.

We have now lost major contracts on two projects because we were determined to manufacture the equipment in the United States. But how long can we postpone making a decision to produce the equipment elsewhere? Before these restrictions were imposed in 1980 Ingersoll-Rand had a reputation in the Soviet Union and other Eastern Bloc countries which set it apart as a preferred supplier for this type of equipment. As discussed, our reputation with the Soviet Union earned Ingersoll-Rand a large single source contract which is extremely rare in this industry. Because we are now effectively foreclosed from the Soviet and Eastern Bloc markets, which are obviously quite active at this time, we are creating competitors where few existed in the past. Moreover, we are giving these competitors other substantial advantages. They appear as reliable suppliers, generate good will and are establishing close relations.

This situation could not arise at a more difficult time. We, of course, need not dwell on the economic difficulties much of American industry faces today. The recession has led to plant closings, bankruptcies and record unemployment levels. The continuing recession in the automobile and truck business, in particular, has caused an almost complete cancellation of new tooling programs by the transportation industry which require our type product. The present possibilities of substantial new business from United States' purchasers of our products are not bright. As a result our APS division has already been forced to dismiss a large number of skilled workers. We are also facing the prospect of additional lay-offs at our Farmington, Michigan plant in the near future. We all know that the Detroit area desperately needs jobs, not more lay-offs.

Take, for instance, the impact on Ingersoll-Rand's Farmington plant of the failure to obtain the Togliattigrad and GDR projects described above. We estimate that these two projects combined involved 380 man-years of labor. We felt certain Ingersoll-Rand would receive contracts involving, at least, 183 man-years of work. Moreover, we would have had to subcontract with other suppliers for about five million dollars worth of component parts. If we had been able to participate in the contracts we would have begun production around March, 1982. Instead since February we have had to lay-off 133 of Ingersoll-Rand's own employees and terminate 256 outside contractors working in our plant.

Due to the depressed United States economy, major manufacturers like Ingersoll-Rand are forced to constrict operations. The ripple effect of these actions has serious implications for other supporting industries and ultimately, we believe, the country as a whole. For example, the APS division's, Farmington, Michigan plant is a major customer of the machine tool industry in the Detroit area and elsewhere. I need not detail the significance of a healthy machine tool industry to the defense and security of this country. Yet at a time when our Government is attempting to insure our continued strength abroad, the very foundation of this strength, a viable industrial base at home, is being eroded because of the inability of companies like Ingersoll-Rand to generate at home the orders necessary to keep itself and supporting industries operating. The point I wish to make is that we believe it is in the interest of the United States that in these difficult economic times American industry be able to compete in the markets that are available to it.

Presently the Soviet Union and other Eastern Bloc countries are offering substantial contracts to American companies. As I have noted, these are not contracts for goods prohibited by the President's export restrictions. Rather they involve products that may be shipped without specific approval from our Government, but we are unable to compete for these contracts because of the uncertainty over United States export policy and the unavailability of political risk insurance in the private market.

We appear before you today seeking your immediate assistance because Ingersoll-Rand, like many other American manufacturers, desperately needs to be able to participate in those markets that have not been foreclosed by current export restrictions. And we seek help in minimizing the unintended impact of such restrictions on American business. We have been assured that it is not Administration policy to prohibit all trade with the Soviet Union or Eastern Bloc countries. Because current policies have had this effect, however, at least for companies which manufacture products not readily marketable elsewhere, we ask only that the Government recognize this effect and provide us with assurance or insurance so that we can again compete in the market and keep Americans working. The predictable cost of taking this governmental action is relatively small; the inevitable cost to the American economy of failing to do so is enormous.

Thank you.

The CHAIRMAN. Thank you very much. We have a divergence of views here, without any question. I just happened to think as I listened to Dr. Stein when he indicated that the best estimate is that U.S. exports to the Communist countries do not increase employment in the United States at all, not even by three-tenths of 1 percent.

Am I taking that out of context? Is that literally what you mean?

Mr. STEIN. No. That is what I mean.

The CHAIRMAN. I wish you would go to Peoria with me. As Peoria goes, so goes the country. You know, the unemployment there is very, very high, and it would be awfully hard to convince the Peorians who are unemployed who were working on products. And as you know, the largest manufacturer in Illinois exports over 50 percent of its products. They do have a substantial business.

Fiat-Allis in Springfield has had direct business cut out through sanctions. International Harvester, a company starved for cash, has a $300 million contract that they cannot implement now for a 14-year-old product. There is no high technology involved in it whatsoever. You cannot convince those employees who are out of jobs now who would have had them if they had gone ahead, that there is an insignificant or no increase in employment. They would be put back to work. They are out of work because they cannot ship those products.

Mr. STEIN. That is the life of an economist, trying to persuade people of a truth that is not obvious. I do not deny that people are out of work in one place or another for that reason and for many other specific reasons. What I am denying is that if you take the United States as a whole and not Peoria in isolation, there are offsetting developments. All we are talking about is whether total demand in the U.S. economy should be a little smaller or a little greater. We have plenty of ways of doing that which do not interfere with our foreign policy objectives. Of course, there will be people who are unemployed. And if I may use the case of the XYZ Corp., there are people who are employed because of that, because the company in Peoria is not exporting. I do not know on what terms they export, but let us assume they are giving export credit for what they are exporting. The fact that they are not borrowing on the U.S. markets to finance that is helping somebody else to be employed.

The CHAIRMAN. It would be awfully hard to convince farmers in my own State where more than half of our agricultural employment is attributable to exports and Communist countries are notably short of grain. Production has been down. They have had inclement weather, of course, in the Soviet Union, but the demand itself is huge. And now we see people employed in Argentina who used to be producing grain for Communist countries. And certainly, the 24 million tons of grain that we sold to the Soviet Union in 1 year has to be produced by someone. Those are people who are employed as a result of that business and who are unemployed as a result of not having the business.

Mr. STEIN. Well, the Argentine grain would be sold somewhere. Those countries who did not buy the Argentine grain because it went to the Soviet Union are buying grain elsewhere. The world grain market is one big pool. There are some snags or obstructions in that pool. My point is this, I do not say that there are no injuries to anybody in the United States. You can say that about anything. A lot of young people are required to register for the draft who claim that they are injured, their privacy has been invaded and their security has been threatened. Well, we do that because there is a war on. But I think that the adverse effects on the United States of interrupting this trade are grossly exaggerated, especially if you listen to the people who have the contracts. If you want to discover the economic effects of this action, you would do a study and try to analyze the indirect as well as direct effects of this, and I think you would have to take account of the factors that I mentioned.

Senator TSONGAS. Would the Chairman yield?

The CHAIRMAN. Could we just go right down the line? Mr. Trowbridge.

Mr. TROWBRIDGE. Mr. Chairman, if I may comment, I think it is a mistake to judge this action and these policies only in terms of the number of dollars that are involved in U.S. trade with the Soviet Union. Admittedly, that trade is very small, particularly in manufactured goods, largely because over the years we have played this lightswitch on and off again. The United States-U.S.S.R. trade is not a large sector of trade per se.

But when we put in this kind of control not only on trade with the Soviet Union but we apply extraterritoriality or we apply other standards of foreign policy controls on the ability of American firms to compete worldwide, we get a much wider effect which jeopardizes the reliability of American suppliers.

I think to judge these controls one really has to look at the worldwide impact and not just the sector of United States-Soviet trade.

The CHAIRMAN. Mr. Dukes.

Mr. DUKES. I agree with Mr. Trowbridge and sort of disagree with Mr. Stein. We are not a very large company. We do about $3 billion in sales. But year to year we export 35 to 40 percent of our total sales revenue. I do not know where the three-tenths of 1 percent comes from, but I know darned well in the 46,000-odd employees that we had in Ingersoll-Rand, a good third of them were associated with export trade.

Now, it may not necessarily be all of the Eastern bloc, but there are other areas as well. Today it happens to be the Eastern bloc. Tomorrow it could be something else.

Another thing that bothers me a little is this. I sense that Mr. Stein is taking an isolationist position in our trade. Pretty soon, we just will not be able to trade with ourselves. I think that is pretty evident in our economy today.

The CHAIRMAN. Do you want to have a rebuttal on that, Herb?

Mr. STEIN. I certainly do. I wore my Adam Smith tie here today to demonstrate that I am a deep believer in free trade. But as Dr. Rashish said before me, Adam Smith said, "defense is greater than opulence." I do not accept the notion that today it is the Eastern bloc and tomorrow it is somebody else. The Eastern bloc is something very different from everybody else. If you were asking me about control of trade with Canada or the United Kingdom, my attitude would be entirely different. But nevertheless, since you just asked me the narrow economic question about what the significance is of controlling $4 or $5 billion worth of trade, I think any economist would tell you that when you consider the pluses and minuses and the indirect consequences, it is of little significance.

With respect to this question of our reliability as a supplier, I do not think what is being contemplated affects our reliability as a supplier except in certain circumstances and in relation to certain customers who are, on the whole, a very minor part of the total free world's business.

The CHAIRMAN. Do you have a position on the 5-year grain deal with the Soviet Union? Would you favor it or oppose it?

Mr. STEIN. I would not make any firm commitment to sell the Soviets any specific amount of goods over a 5-year period.

The CHAIRMAN. We did not do this for our convenience. We did this because of the chaos in our own market when they were operating in the free market. And they buy as a single source and they were manipulating our market so badly we had to have regulations on them in order to put minimums and maximums so that we would know where they would be coming in. That was the history of a long-term grain agreement.

Mr. STEIN. The problem was, that we had no system at that time for acquiring prompt information on the volume of the trade. I think we should have that kind of information, and I think if it were known, the market would take care of the rest of the problem. But I see no reason to commit ourselves for 5 years to provide grain. I think you have to recognize what the difference is here. We are spending $200 billion or so a year, and we are taking that out of the taxpayers' pocket, in order to defend ourselves against whom? Against this enemy. So we are saying, should we incur this trivial economic loss if that will help us achieve our abjective? I do not know whether it will help us or not, that is a different question. But I am saying that relative to the amount that we are willing to devote to defending ourselves, this amount is trivial.

The CHAIRMAN. Did you favor the President's 1-year grain agreement extension?

Mr. STEIN. No, do not think I would have done that, although it is a close case. I am not saying that we should cut off trade with the Soviet bloc. I am saying that we should trade with them when we think there are political and national security advantages to us from doing so. We should try to get those advantages that we can, we should consider whether there is a net benefit to us, and we should not be deterred by the fear that we are hurting ourselves if we do not trade with them.

The CHAIRMAN. May I put a specific question to you, Dr. Stein, one that I was faced with many years ago. On this lightswitch diplomacy that we had, sanctions were imposed on Bell & Howell for film printers, perforators, and splicers for the professional movie industry in the Soviet Union. We had a licensee, the J. Arthur Rank organization. We manufactured in England under license there. We supervised production, but it was all their direct labor, their overhead absorption and so forth.

The only difference in the product—and they are a quarter of a million, half a million dollars apiece, these printers and perforators and splicers and so forth—was a trademark, the name. One of them said "Bell & Howell, manufactured in Chicago," the other one said "Bell & Howell, Rank, manufactured in London."

On one we got all the overhead absorption, profit, which is handsome, and all the direct labor absorption, and the employees were Illinois, U.S. employees. Over in the other one we got just a royalty. It helped our cash flow, but was otherwise insignificant.

Now, does that make any sense for this country to embargo that kind of a product when the identical product is available someplace else and is shipped immediately?

Mr. STEIN. I am not in favor of controlling exports where there is not some gain expected from it.

The CHAIRMAN. OK, now we are coming together.

Mr. STEIN. All right. But what you asked me was about the cost to the United States. The question of whether there is a gain is a dfferent one.

The CHAIRMAN. But what is the difference between all of these manufacturers who are saying that when there is no unique technology, when it does not relate at all to the defense establishment of the country, but it is an agricultural product or something like that? We could list a whole list of things where the identical product—you take, for instance, a Caterpillar pipelayer and a Kamatsu pipelayer and you cannot tell the difference. You do not know "which twin has the Toni" in that regard.

The Japanese just picked up that market and they supplied it. And Kamatsu has a reputation around the world as a reliable supplier you can count on, and Caterpillar has, as the board chairman said, a deteriorating reputation as a reliable supplier because of American policy. And it has not hurt the Soviets one bit, not one bit whit.

Mr. STEIN. Well, I think you have to determine whether you think it is going to hurt the Soviets. I do not believe that in that case the damage to the United States was serious, taking the damage to the United States as a whole. And I have said earlier you should not be deterred from taking any action that is of even slight value to U.S. security or U.S. foreign policy by the fear that controlling trade has significant costs to the U.S. economy. That is the point that I am arguing.

Now, you are arguing that this is of no value to us from the national security or foreign policy standpoint. I am not an expert on that subject. I would return to some of the things that Mr. Rashish said this morning, which I think are very serious. We need to find a way, or we need at least to explore very seriously the possibility, of mobilizing the combined economic resources of the West for dealing with the Soviet bloc. Also, we should seek ways to use our economic resources to reduce their total output, their total rate of growth, and their total capability for pursuing their own objectives. We can do that and I think we should not be deterred by the fear that this will have adverse economic consequences on us. And really, I think that our European friends enormously exaggerate the significance to them economically of this kind of dealing.

The CHAIRMAN. Thank you very much.

Senator Tsongas, I will go and vote now. I know Mr. Dukes wanted to be recognized, and then we will make up the extra time that I have taken.

Senator TSONGAS. May I inquire about something? Will you be coming back? Because I will not be coming back after I vote.

The CHAIRMAN. Yes, I will be right back.

Senator TSONGAS [presiding]. I will have to leave in 3 minutes, gentlemen. And I am compelled to ask this question before I leave.

Mr. Stein, I find your theory fascinating. It is sort of like a starfish theory, that if you pull off one leg——

Mr. STEIN. Excuse me; what kind of theory? I did not hear what you said.

Senator TSONGAS. Starfish. There are some in Nantucket, I believe. It is that if you pull off one leg, another leg will grow to replace it, that if Ingersoll-Rand does not do business with the Soviets and Fiat Co. does, that somewhere else in the system an appendage will grow to make up the business to Ingersoll-Rand. Is that correct?

Mr. STEIN. Yes, that is true.

Senator TSONGAS. If you follow that through, if Ingersoll-Rand does not exploit and Fiat does, the Soviets are not hurt, obviously.

Mr. STEIN. No. That is not the subject to which I addressed myself.

Senator TSONGAS. OK. Now, would it also be true if Ingersoll-Rand exports to nobody and just does it all domestically, that somewhere else something will happen to compensate for it?

Mr. STEIN. As far as employment is concerned, yes.

Senator TSONGAS. Well, if you follow that through, then every company in this country does not export to anybody and we will have a totally constrained economy and we would still be in the same position?

Mr. STEIN. As far as employment is concerned, yes. We could have full employment in the United States, at least the same number of people employed that we have today, if we did not trade at all. The gain from trade, as I tried to point out, is not in getting people to work. We can get people to work in digging holes and filling them up again. The gain from trade is the greater value of what you import as compared to the value of what you export. As I indicated, if you think that 100,000 bottles of vodka are worth more than 100,000 cases of a soft drink and that is one of the terms of the trade, then that is what the benefit is, what you think is the superior value of that much vodka over that much soft drink. That is the most banal proposition in economic theory.

Senator TSONGAS. I think neither the twain shall meet, and you are not going to convince me, I am sure.

Mr. STEIN. I did not think I would.

Senator TSONGAS. While you are at it, you might try the Europeans. You said we are at war, and we wonder who the war is with, the Europeans or the Soviets.

Mr. STEIN. I do not wonder for a moment who we are at war with. Do you?

Senator TSONGAS. Did you read the papers this morning? They suggest we are at war with the Europeans.

Mr. STEIN. I read the papers every day. Of course, the Europeans are dissatisfied with us about many things. And I think they are wrong about many things. They are dissatisfied with our economic policy. They complain all the time about our interest rates, our budget, and our monetary policy. Every government has a scapegoat for its economic policy. If you are the United States, being the last in the line, the only scapegoat you can have is the previous administration. But the Europeans have us. If I did not think that the Soviet Union was the enemy, I would not deliver this testimony today.

Senator TSONGAS. I have no doubt that you feel very strongly about this. Do you think that trading with the enemy has moral implications?

Mr. STEIN. Yes, I do. I do not want to have a bloody war. I want to achieve our objectives by means short of bloodshed, and I think that is a moral objective.

Senator TSONGAS. Do you think Ingersoll-Rand or XYZ company by trading those truck parts with the Soviets will engage in activity that has moral implications?

Mr. STEIN. Well, these companies do not have responsibility for the conduct of U.S. foreign policy, for preserving the security of the United States, or for averting a bloody war. So I do not attribute to them any moral qualities positive or negative in what they are doing. They are doing what they are supposed to do, which is to sell where they can make money. It is a function of the U.S. Government to protect the national security.

Senator TSONGAS. Mr. Trowbridge, does your statement reflect the position of NAM?

Mr. TROWBRIDGE. Yes, Senator, it does, very definitely. It was recently approved by our trade policy committee.

Senator TSONGAS. It is getting fearful when I am in agreement with your association so often. [General laughter.]

Mr. TROWBRIDGE. It is not illegal or immoral or fattening, Senator. [Laughter.]

Senator TSONGAS. I may have to go back and rethink that. And let me say the committee will stand in recess until Senator Percy gets back. He may wish to question you further. And I also thank you for spending your money in Nantucket, but if you had not gone there, of course, somebody else would have been there. [General laughter.]

Mr. DUKES. It was pretty hard to get a room. [General laughter.]

[Brief recess was taken.]

The CHAIRMAN [presiding]. The committee will come to order.

I will direct this question mainly to Mr. Trowbridge and Mr. Dukes. You both cite the unpredictability of U.S. administrations' application of export controls as one of your worst problems in international trade. What would each of you feel to be a reasonable standard of predictability in government implementation of export controls?

Mr. SECCOMBE. Once a company enters into a contract with approval, there should be some form of stability or protection provided through the time we can complete that contract. The biggest problem we face is even though we kept the Government completely informed—well, originally on about a quarterly basis and then a monthly basis and then down to the last days it was on a weekly basis and a daily basis—then 4 days before we were supposed to fulfill the contract, this arbitrary decision came out.

You mentioned earlier that some of the companies feel they are losing a sense of reliability with their customers. And certainly we felt that way, and for very good reason. We were restricted from shipping a system that was an absolute identical duplicate of one that had been shipped 5 years earlier. In fact, the technology was at that time, you know, 7 years old. We did not even update the technology because we were providing the duplicate system.

And at least some predictability through the life of the contract. And we understand some of the problems with that, and that is why, I guess, we are suggesting some form of insurance of retribution if policy must be changed.

The CHAIRMAN. Mr. Trowbridge.

Mr. TROWBRIDGE. Mr. Chairman, I would think that going back to the criteria which Congress put into the 1979 act and then following them consistently would certainly be a very helpful start from the point of view of administration of the current law. Those criteria deal with the ability to make a decision effective.

Second, I would propose an effective grandfather clause concept in which contracts made, approved, and licensed would be honored and allowed to proceed by the U.S. Government.

Third, I would think that reliance on the clarification of the COCOM list is terribly important. It is a list which has been significantly reduced over the years. But there is a tendency to go beyond the list by the U.S. administration; whereas the other partners in the operation—European, particularly—limit their concern to those items on the COCOM list. I think we go well beyond it.

I would much prefer to deal with a known set of criteria, a known set of classifications, and a willingness on the part of the U.S. Government to acknowledge the sanctity of contracts. Once made, they should be fulfilled.

And, hopefully, the U.S. Government should also recognize the extraordinary difficult inherent in the reach of its law into somebody else's backyard. That extraterritoriality question is not just difficult from a trade policy point view, but it has, as we see in the current situation, extraordinarily explosive political implications.

The CHAIRMAN. Mr. Trowbridge, you made a comment that NAM members have made to you on the incomplete and perfunctory, as you called it, nature of administration advance consultation with affected business on the December and June export controls. Would you care to expand on that?

Mr. TROWBRIDGE. Well, sir, we have searched far and wide for companies and individuals who indeed could give examples where consultations were held, and we have not been able to find any. It is a portion of the law. There is perhaps a record of consultations. We just, within our scan of the horizon, have not found anybody who was involved.

Certainly, the companies that were most directly impacted, General Electric and Caterpillar, probably had some discussions. But I do not believe that is the full range of consultations with the business community which is contemplated in the law.

The CHAIRMAN. Well, I think the first comments that these companies made during the comment period were in the White House meeting that I arranged. Jack Welch, chairman of GE, was in the meeting as was Lee Morgan of Caterpillar. And they both did make comments at that time.

Does NAM plan on introducing comments during the comment period that ends August 21 to the Department of Commerce?

Mr. TROWBRIDGE. In addition to this testimony, we are going to be consulting with the Commerce Department and introducing suggestions for their consideration, yes, sir.

The CHAIRMAN. Would you be making any recommendations with respect to narrowing the extremely broad scope of the nonpipeline-related equipment affected?

Mr. TROWBRIDGE. At this moment I am not sure of the nature of our recommendations, but certainly that would be one area that we would want to try to help them narrow down.

The CHAIRMAN. Dr. Stein, other industrial country governments offer companies political risk insurance against changes in trade and commercial policy with respect to specific countries. Do you think the U.S. Government should do so? Would you comment on the ability of the private sector to provide this type of insurance?

Mr. STEIN. Well, I think that may be a good idea. I am not sure whether it is or not. When I suggested it in an article in the Wall Street Journal, I thought I was inventing that. I think first the U.S. Government should make its position clear, and its position should be that it offers no guarantees, no commitments, and no assurances that trade with the Soviet Union, or its bloc, will not be interrupted. So everybody should know what the risks are. If that were known, the private sector might generate some capacity for providing insurance. If we think that it is important for us to conduct trade with the Soviets and be able to interrupt it, then I think we will have to provide some governmental insurance. And I do not think that is a bad idea.

Mr. TROWBRIDGE. Mr. Chairman, if I might comment. It is the one thing that we do know, that this trade is interruptable. It has been proven time after time.

Mr. STEIN. Then why is everybody so shocked?

Mr. TROWBRIDGE. Because we would rather be able to plan and complete trade rather than have it pulled like a yo-yo.

Mr. DUKES. Growth is dependent on credibility and consistency, and that is what we ought to have. This so-called lightswitch type of treatment—and I will use those words again—does not give us any basis for credibility and consistency. That is what you want when you trade with anybody or any associations you might have.

Mr. STEIN. Well, you see, we are not talking about trading with just anybody. We are talking about trading with the enemy. And unfortunately, we live in a world that is full of uncertainty and unpredictability. The question is where is it going to be allocated and who is going to bear it? You are not going to make the world more predictable and secure unless you have a firm security against this threat.

The CHAIRMAN. But when you say trading with the enemy, we are not talking about providing strategic material that would uniquely add to their defense capability. I do not think the business community would ever argue with that. No one that I have heard in business at any time has ever said trade if we have something unique, a computer that would provide an input with them that would help them with their guided missile systems or something, there is not any manufacturer who would do that.

We argued this out in the Export Control Act, which I modified when I was on the Banking Committee in the Export Administration Act. We put this pattern in, that if the technology was not unique and was available elsewhere, we should not be prevented from providing that. That is the distinction.

The question is: Who are we hurting? We are not hurting them. We are just hurting ourselves.

Mr. STEIN. The usual situation is when there is voluntary trade, both parties gain. So they gain and we gain. I think it is more important for us to deprive them of that gain from trade than to retain the gain from trade for us.

I think if we could reduce their rate of real growth to 2.9 percent instead of 3 percent, that would be a great triumph for us. The numbers are such and the quantities are such that the effect on us would be very small and the effect on them would be bigger. That is the one great card that we have in this struggle, that we can afford a lot more than they can.

The CHAIRMAN. It depends on whose ox is gored, of course.

Mr. STEIN. You are skeptical. I would like to read something that George Kennan wrote in "Russia and the West Under Lenin and Stalin." It is his view of what the Soviet attitude would be toward the West. Of course, this was written some time ago, but I think it is still relevant.

He says that they will say:

> Since an interval must unfortunately lapse during which we can give you the coup de grace—we want you during this interval to trade with us; we want you to finance us; we want you to give us the advantages of full-fledged diplomatic recognition, just as you accord these advantages to one another. An outrageous demand? Perhaps. But you will accept it nevertheless. You will accept it because you are not free agents, because you are slaves to your own capitalistic appetites, because when profit is involved, you have no pride, no principles, no honor.

Well, that is a strongly worded proposition. But I think we have to strike a balance in the laws. If we interrupt this trade the loss is very small compared with potential gains. And, of course, I would not do it in cases where there were no potential gains.

The CHAIRMAN. If sanctions were imposed, do you think a distinction should be made between sanctions on contracts that have already been entered into and then future contracts? What happens in a case where, let us say, a company acting in accordance with law, with no problem on the license, entered into a contract to produce a product, spent three-fourths of the contract price in producing it, but has not shipped it yet. And suddenly, they are prevented from shipping it.

Who is to absorb that kind of loss? How many companies can take that kind of loss, if they had in reliance upon existing law, entered into the contract?

Mr. STEIN. But existing law does not exempt them from the operation of the Government is operating under statutory authority and that we are not talking about the Government must exercise some prudence, and I would think it would have a different standard with respect outstanding contracts than with respect to business that had not yet been entered into. But I do not think that the Government in this situation can bind itself against using this instrument. I mean it is as if they were to make a contract with the U.S. Marines that they would never send them out of the Western Hemisphere. This is an instrument of U.S. policy and will be subject to certain difficulties for the people involved.

The CHAIRMAN. Of course, the purpose for having hearings here is to determine what should be done. This comes under the province of the Finance Committee, of course, specifically. But we work together very closely on foreign policy and matters affecting trade, and we can make laws that would provide for that very thing: that you could not break a contract but you could prevent a new one from being entered into.

How does the business community feel about making that kind of distinction? At least a contractor and a purchaser knowing that once a contract had been entered into, it could then be implemented?

Mr. TROWBRIDGE. I think it would be a very useful, helpful assurance, Mr. Chairman.

Mr. DUKES. I agree with Mr. Trowbridge 100 percent. If we had a contract, we would know we would be able to fulfill it. If in the future, for whatever reasons there might be, trade has to be suspended, so be it.

Mr. SECCOMBE. I agree, possibly with the addition: short of a total embargo of all goods.

The CHAIRMAN. At this point I would like to insert in the record a useful framework of premises for approaching economic policy toward the U.S.S.R. that was prepared for the committee's work on this issue by Dr. John Hardt of the Congressional Research Service.

Dr. Hardt has been actively involved in the preparation of these hearings and has been present for the 2 days of the hearings. I would like to acknowledge his help with deep gratitude.

[The material referred to follows:]

## PREMISES UNDERLYING U.S. POLICY ON COMMERCIAL RELATIONS WITH THE U.S.S.R., PREPARED FOR THE SENATE FOREIGN RELATIONS COMMITTEE BY JOHN P. HARDT, CONGRESSIONAL RESEARCH SERVICE, LIBRARY OF CONGRESS

The Reagan and Carter Administration embargoes and sanctions against the Soviet Union raise certain questions about the assumptions underlying these actions, which are reiminiscent of the U.S. policy of economic cold war during the 1950's and 1960's. Economic warfare, however, has not characterized the Western policy towards the East since the late 1960's. Instead a broad spectrum of policies ranging from encouraging interdependence to fostering isolation, has been characteristic of recent policy. This varied East-West commercial policy has been based upon a number of premises accepted to varying degrees both in the United States and the other Western industrial nations. We shall identify these central premises; indicate the range of professionally accepted views; suggest some tenable assumptions for alternative policy strategies; and examine some of the questions that would need to be explored in some detailed inquiry into the nature of these premises:

(1) The Soviet economy exhibits some degree of dependence on Western exports of technology and grain as well as the provision of credit, and, hence is vulnerable to their denial.

(2) The United States can either gain control of or coordinate a policy of denying technology, grain or credit to the U.S.S.R. through unified Western action.

(3) The economic vulnerability of the Soviet Union to a united Western policy of denial might be effectively used to influence major Soviet domestic and foreign policies.

(1) Regarding the premise of Soviet vulnerability to denial or dependence on Western exports of technology, grain, and credit:

On the one hand, the availability of Western technology and grain, along with access to government and commercial credit, might result in significant improvements in the quantity and quality of Soviet economic performance, especially in the long run.

On the other hand, the Soviets might adjust to the denial of Western technology, grain, and credit, albeit with some loss of time, quality and volume of output. No absolute interruption of production or economic crisis is likely to occur as a direct result of negative Western economic actions.

(2) Regarding the premise of U.S. control or coordination of a Western commercial policy on supplying technology, grain, or credit to the U.S.S.R.:

On the one hand, all members of COCOM and OECD agree on the following: (1) the desirability of established limits on normal commercial relations to avoid directly enhancing Soviet military capability; (2) the desirability of a common policy on East-West credit; and (3) the inevitability of an interrelationship between trade and diplomacy in East-West relations.

On the other hand, no member of COCOM or OECD agrees with the current U.S. administration's definition of strategic goods to include products and technologies that have only indirect military implications; none accepts the view that simply weakening the Soviet economy is an appropriate end in itself; none accepts the use of U.S. "foreign policy criteria" in export licensing or of embargoes and sanctions. A common credit policy that would provide for specific restrictions on Western competition for Eastern sales in a recession-ridden world market would seem to be extremely difficult to devise.

(3) Regarding the premise of Soviet willingness to alter domestic and foreign policies in order to avoid losing the benefits provided by normal access to Western technology, grain and credit:

On the one hand, the Soviets deny that external factors would be allowed to influence their "internal" affairs and continue to follow the main lines of their foreign policy in Afghanistan, Angola, Cuba, Eastern Europe, and other foreign areas of Western concern, in spite of economic sanctions and embargoes. Due to lack of evidence it is not possible to assess with precision the effectiveness of recent Western embargoes and other tools of economic warfare influencing Soviet domestic and foreign policy. Certainly, their effectiveness has not been proven.

On the other hand, the Soviet leaders appear to perceive the economic benefits of Western economic ties as critical to economic growth (but not to system survival). Therefore, trade and credit policy could potentially be a relatively strong and flexible tool of Western diplomacy, if effectively used.

## TENABLE GENERAL ASSUMPTIONS FOR DEVELOPING EAST-WEST COMMERCIAL POLICY STRATEGIES

(*1*) The modernizing Soviet economy is dependent on expanding economic relations with the developed West for improvements in performance in critical economic sectors. Isolation from the advantages of Western economic interaction would be costly to the Soviet Union in both quantitative and qualitative performance. All Eastern economies are heavily interactive with the West, and more so now than in the past. Without external economic relations, Soviet economic performance would fall farther short of their potential.

Projections of Soviet economic growth for the 1980's by Western specialists range from 2 to 4.5 percent per annum. [Wharton Econometrics estimates for 1985 are 3.6 Baseline; 2.6 low; 4.5 high, depending on level of military expenditures, trade with the West, and economic reform.] Some suggest that with an extreme confluence of negative events (poor weather, critical material, manpower, transportation bottlenecks) growth might even be negative for a short time. Few if any foresee the possibility of economic collapse.

In any event, the issue of economic performance is likely to be a centerpiece of the struggle to succeed Leonid Brezhnev.

(*2*) While there continues to be a fundamental area of Western agreement on trade policy with the East, the U.S. policy of explicit denial of many trade and credit benefits, formulated in response to or directly influenced by specific Soviet political actions, has created a basic division in Western policy. Unity in Western policy is necessary for effective use of Western trade in diplomacy with the East.

While Eastern trade is an issue of economic importance in West Europe and Japan, for the United States—except for the grain trade—East-West trade is primarily a political issue. Moreover, Western debate on Eastern policy has not stressed building on areas of agreement, but exacerbating areas of conflict. The U.S. debate on energy equipment contracts not likely to change has generated heat, but has thrown less light on areas of credit and export control where bases of agreement exist.

*(3)* While implicit and long-term commercial influence remains among the strongest of potential Western influences on Soviet action, the explicit political policy of short-term denial through embargoes and sanctions has been widely perceived as counterproductive, especially in the U.S. farm and European business and governmental communities. Recent U.S. policy emphasizing sanctions and embargoes is likely to continue to be unilateral. Moreover the presumed benefits from sanctions and embargoes that purportedly accrue to the general national interest of the United States and of West Europe, actually accrue to third countries. The costs are borne by specific Western business and U.S. farming interests, while the beneficiaries include Argentine agriculture and Austrian industry.

### ALTERNATIVE STRATEGIES: RANGE OF OPTIONS

*(1)* The strategy employed by the United States in the Afghanistan sanctions and embargoes of the Carter administration and their continuation through Polish martial law sanctions of the Reagan administration, may be termed a unilateral selective and conditional denial policy. This trade policy is neo-mercantilist in that the political benefit of the state is considered paramount, and may be maximized only at the expense of the sacrifice of economic benefits of other states.

A cold war U.S. trade and credit policy has been divisive in the West, especially as it included embargoes, economic sanctions, and a marked tightening of export controls. This neo-mercantilist policy appears designed to have a considered, detrimental effect on economic growth, modernization, and consumerism in Eastern Europe. A mercantilist policy keyed to benefiting the power of the U.S. state at the expense of foreign trading partners provides Soviet and other East European leaders the opportunity to blame their economic failures on the United States. Such a discriminatory policy has a greater impact on the economically weaker East European countries than on the Soviet Union and might strengthen the latter's inclination to use force and tighten controls in Eastern Europe.

The West Europeans have not been inclined to join the United States in adopting a cold war or discriminatory policy. If they did, a unified Western policy of discrimination might lead to a return to the mutual East-West isolation of the 1950's. Such a policy might well make slow economic growth more likely for Eastern and Western Europe and exacerbate East-West tensions.

*(2)* A unified Western, benefit-penalty policy keyed to areas of critical Soviet dependence and Western consensus on policy has potential for maximizing the influence on the Soviet Union by coordinated Western effort for providing or withholding critical resources of maximum economic impact on performance. Two basic commercial policy options for unified Western policy, available to the United States—(a) a preferential or "Helsinki" policy, or (b) a market or "laissez faire" policy—would have quite different effects on the U.S. effort to forge a common Western policy.

By adhering to a Helsinki option—following the letter and spirit of the Helsinki Final Act "Basket Two"—U.S. trade and credit policy could form the basis for a unified Western policy. Commercial policies following the Helsinki agreement involve government intervention: to foster commercial exchange, to facilitate freer flow of factors without trade restraints and to provide for government credit which is more favorable than that which is offered by commercial facilities. Under the Helsinki option Western preference would be critical to attaining higher levels of economic growth, modernization, and consumerism in Eastern Europe. Adopting the Helsinki option in the West might have a beneficial effect on the economic performance of all the nations of the CMEA-Six. Such a preferential policy orientation would offer more benefits to the East European members of CMEA than to the Soviet Union and would likely serve as a counterweight to Soviet influence on the smaller members of CMEA.

A preferential Western credit policy to East Europe might not necessarily involve any new loans to any of the CMEA-Six at this time or in the 1980's, especially from commercial banks. Even with strict conditionality for payment of interest and rescheduled principal, new resources from Western banks might not be available on commercial grounds for Poland, Romania or the other CMEA countries. Yet, some Western governments might be willing to make credit and credit guarantees available to the economically stronger East European countries under certain political conditions, including some forms of economic reform. In that case, Western commercial banks might re-evaluate their lending policies based on prospects of improved East European planning and management. Reform, in turn, might facilitate economic conditionality on rescheduling and repayment. Specific U.S. bank proposals for joint ventures with Poland currently reflect this option.

Under a second, laissez faire or market option, U.S. trade and credit policy toward East Europe would probably be viewed as discriminatory by East and West Europeans. Without the Western governmental umbrella, commercial relations between Eastern Europe and the West probably could not continue as in the past, given current economic woes in Eastern Europe. For their part, U.S. banks and firms, which generally lack the long experience in dealing with the CMEA countries that some banks and firms in Western Europe have, might conclude that without the U.S. governmental umbrella, they could not deal profitably with Communist countries due to their control of domestic markets and foreign trade monopolies. As European and Japanese governments are heavily involved in East-West and North-South trade, a laissez faire orientation would not be likely to develop in their East-West trade.

Whether Western trade and credit policies are preferential or laissez faire might also indirectly influence Soviet policy toward East Europe. Western analysts generally consider Soviet energy policy towards East Europe preferential, as the Soviets supply oil and gas to East European countries at less than the OPEC or world market price and accept a mixture of hard and soft currencies as payment. They conclude that Soviet terms for energy sales confer an implicit trade subsidy to East Europe. A preferential Western policy would tend to strengthen East Europe's position vis-a-vis the Soviet Union and might thereby encourage a similar preferential Soviet policy towards East Europe: continued preferential energy supplies and forbearance on payment of rising East European debts to the U.S.S.R. To the extent that preferential Soviet policy is encouraged toward East Europe by West European preferential policy, this interaction of European and Soviet policy in East Europe may tend to reinforce European inclination toward the Helsinki option.

Although different the Helsinki and market options are not necessarily incompatible; with the Europeans opting for the former, the United States for the latter. Without government trade and credit support, U.S. firms would be less competitive with the other Western countries involved in trade with the East. The differences might encourage adoption of the German notion of spheres of commercial interest and shared responsibilities for Western countries; e.g. U.S. lead in agriculture, FRG in mining and energy.

## Discussion

### 1. VULNERABILITY

A. What is the degree of interrelatedness and openness of the Soviet economy as related to the world market? How should it be calculated? When does interrelatedness and openness become vulnerability or dependence?

B. What critical influence may Western technology, equipment, grain and credit have on the timing and quality of Soviet performances in key areas: military capability, agriculture, energy, metallurgy, computer usage, etc. What are the most likely positive stimuli and negative constraints of East-West trade efforts? How do short and long-run impacts of Western commerical policy compare?

C. Is it fair to equate the projected value of Soviet hard currency imports and the enhancement of their military programs that we should respond to in our defense planning?

D. How significant are the dual uses of Western civilian imports for military programs in the U.S.S.R.? What is the potential effectiveness of the diversion of Western imports to military programs?

E. Is trading with any or all members of CMEA tantamount to trading with the U.S.S.R.? Can economic "punishment" or "reward" of an East European country be effectively transmitted to the U.S.S.R.?

### 2. UNIFIED WESTERN POLICY

A. What are the new aspects of U.S. strategic technology policy under the Reagan Administration? Is there still an effective role for COCOM in formulating and administering Western commercial policy with the East?

B. Do Western governments have unified views on the need for government credits and guarantees in Eastern commercial relations? How does one distinguish export subsidies from normal trade financing?

C. Are Western governments agreed on the need to differentiate between nations in carrying out their commercial policies with the East? Would COCOM members accept the view that trade with any CMEA country is trade with the U.S.S.R.?

D. Do all countries view some uses of trade in diplomacy as effective? How about the United States use of foreign policy criteria in licensing? Providing or denying tariff and government credit facilities through legislation? Use of periodic embargoes and sanctions?

E. Who bears the cost of embargoes and sanctions? Who receives the benefit? What would a policy of equitably sharing the cost of embargoes and sanctions entail?

### 3. SOVIET RESPONSE TO WESTERN COMMERCIAL ACTIONS

A. How firm is the Soviet commitment to modernization and external trade?

B. Is there a potentiality of a guns/butter/investment debate in the U.S.S.R.? If so, what are the implications for U.S. policy?

C. Can or will the U.S.S.R. accept the adoption of Western systems of planning and management to improve its economic efficiency?

D. How has the U.S.S.R. responded in the past to Western embargoes, sanctions, explicit trade constraints?

E. What internal Eastern constraints on East-West commercial relations may be relevant to Western partners: hard-currency shortages, domestic investment limitations?

F. What long-term commercial commitments with the West are the U.S.S.R. and CMEA likely to accept and honor?

The **CHAIRMAN**. Finally, we will keep the record open for a week to allow the submission of any relevant material which other members may wish to insert. And it may be possible that other members who could not be here today would want to submit questions to you for the record. We very much appreciate your responding to them. We will keep the record open for a week to 10 days for that purpose.

Are there any comments any of you would like to make in addition? [No response.]

Again, we very much appreciate it. Dr. Stein, it is always helpful to have a different point of view. I think it makes the hearing not only more interesting but also more productive for us because we do have and try to have balanced panels, and your taking an opposite position on some of these matters was helpful to us to keep that balance.

Mr. **STEIN**. Thank you.

The **CHAIRMAN**. Thank you all. There being no further business, this committee is adjourned.

[Whereupon, at 1:22 p.m., the committee adjourned, subject to call of the Chair.]

# APPENDIX

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[From the Washington Quarterly, Spring 1982]

*Why do U.S export controls and embargoes seem ineffectual, and how can the United States use economic leverage in the aftermath of the Polish crisis?*

## A New U.S. Export Control Policy

(By Charles McC. Mathias, Jr.)*

Export controls are as old as the institution of government itself. Americans readily recall the efforts by English monarchs to prevent the colonists from acquiring industrial machinery. Generations of American school children have been taught that woolen-mill technology smuggled to New England broke the English embargo and brought the Industrial Revolution to the New World.

Smuggling may not be the world's oldest profession, but it was surely one of the earliest responses to attempts by primitive governments to achieve their goals by regulating trade. Where smuggling succeeded, export of import controls failed. Modern controls have gained in sophistication, but so have modern smugglers.

The adoption of a free-market philosophy in the nineteenth century posed as basic a challenge to export control policy as smuggling. Representative governments found it harder to justify to their citizens the economic burden of controlling exports in order to support other objectives. In the nineteenth century, economic warfare was employed as an alternative or supplement to military force in cases of severe international conflict. But popular recognition of the economic costs tended to restrain the governmental impulse to control trade.

Twentieth century leaders have greatly expended the repertory of export controls and have proclaimed a new faith in their efficacy, but the basic struggle between free markets and national policies rages undiminished. A fundamental tenet of the League of Nations Covenant was that united action by member countries against a single aggressor could preserve world peace. The failure of limited economic sanctions to stop Mussolini's invasion of Ethiopia in 1935 and Japan's bombing of China in 1937 disabled the League, but only fueled the debate between those who contend that sanctions are inevitably too weak a response to military aggression and those who believe wider sanctions would work. From the latter perspective, the ineffectiveness of sanctions, plus the failure to invoke economic sanctions when Hitler occupied the Ruhr and when Japan invaded Manchuria, were marks of the League's political weakness, rather than a sign that economic sanctions could not be made to work.

The United States stood aside during the trials of the League, but waged its own contest over export controls. Populists blamed both the great War and the subsequent Great Depression on the merchants of death and their financiers. Legislation was enacted with righteous fervor: The United States would never again, they said, finance foreign arms purchases or supply weapons for foreign wars. But while the rhetoric of the isolationists still echoed from shore to shore, ships left America carrying scrap metal to Japan's busy munitions plants and Hitler rearmed Germany with the resources of the Ruhr. The aggressors built arms industries while the United States debated whether it could safely have an arms industry.

The U.S. government imposed controls on exports sporadically prior to the 1930s and has done so continuously since then. A wide range of U.S. products are subject to export controls, depending upon the intended foreign destination, in order to advance U.S. national security or foreign policy or to alleviate "short supply" conditions in the United States. Arms, "dual-use" and nuclear-related equipment and technology may be exported only with a validated license, except to a few close allies. Nearly all U.S. trade with North Korea, Vietnam, Kampuchea, and Cuba is prohibited. Crime control and detection equipment cannot be exported without a license to any country except members of NATO, Japan, Austrialia, and New Zealand. Exports of unprocessed Western red cedar are subject to controls, as is the export of horses by sea for slaughter (horses traveling abroad for happier purposes presumably need only check in with animal health and maritime authorities.

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To bring order and clarity to U.S. export control policy will require clearer thinking about the motivations for export controls, an appreciation of how they can be made to serve American interests most effectively and efficiently and, above all, a national consensus on what should and should not be attempted through export controls.

### PURPOSES SERVED BY EXPORT CONTROLS

Export controls, like other government interventions in the marketplace, ought to be limited to what is necessary in order to serve high national purposes effectively. Most controls serve broad national objectives, at least in theory, but the making of export control policy is no freer from special interest and parochial pleadings than other political processes. English mill-owners in the eighteenth century helped persuade their government to restrict the export of industrial machinery as well as the import of finished goods from the American colonies.

One need not search very deeply into current United States export controls to find analogies. Americans who derive their livelihood from access to domestic resources, products, or technologies at reasonable prices advocate imposition of export controls with a recklessness matched only by the self-interested pursuit by exporters of unlimited trade opportunities. So-called short-supply controls may be subject to the pushing and pulling of interest group politics, but national security, foreign policy, environmental, and "safety" controls on exports are also targets for groups with interests narrower than those of the nation as a whole.

The highest purpose export controls can serve is to prevent acquisition by enemies or potential enemies of militarily significant items. U.S. controls on nuclear-related equipment and technology, nonnuclear munitions, and nonmilitary goods and technology that can contribute significantly to military potential deserve top priority in U.S. export control policy. Giving top priority to controls on militarily critical exports implies much more than simply a first claim on the administrative resources of the Federal Government.

Maintaining efficient and effective export controls on the transfer of militarily critical technology may require less extensive, not more extensive, controls on end products. Trying to control too many exports to too many exports for too many purposes interferes with essential controls and contribute to the erosion of the political and economic base upon which U.S. national security is founded. A 1976 Report of the Defense Science Board Task Force on Export of U.S. Technology (known as the Bucy Report) emphasized the need to focus on the "critical technologies" that "transfer vital design and manufacturing know-how most effectively" to the Soviet Union. The Bucy Report concluded that controls on critical technology and certain "key stone" equipment should be tightened, but controls on end products should be loosened. The Export Administration Act of 1979 (P.L. 96–72) directed that export controls impose for national security purposes should cover and be "limited to militarily critical goods and technologies and the mechanisms through which such goods and technologies may be effectively transferred" (Section 5[d][1], 93 STAT. 508).

National security export controls should be focused largely on militarily critical technologies and equipment in order to retard Soviet acquisition of the know-how to design and manufacture military systems. The loss of the U.S. missile or plane to the Soviet Union could give their engineers valuable clues to weapons design, but far more serious would be a project that trained Soviet engineers in techniques essential to designing advanced weaponry. The difference between having the blueprint and having access only to the final product is large, but still larger is the difference between having blueprints and being shown how to design, construct, and produce the item. There are cases in which the Soviets have tried to "reverse engineer" a pilfered U.S. military item but have not succeeded for decades. Unfortunately, there are cases in which the Soviets have acquired civilian production technologies and successfully applied them to their military sector almost immediately.

Controlling both products and technologies, or all trade for that matter, might seem to be the simplest way to slow the advance of Soviet military capabilities. The

United States maintained a nearly complete embargo on exports to the Soviet Union from 1949 to 1954 and very wide controls until the mid-1960s.

The failure of the U.S. embargo on trade with the Soviet Union was due to the growing ability and willingness of other non-Communist countries to supply goods and technology to the Soviets. Even America's closest allies were unwilling to maintain a broad embargo, and the United States lacked the means to persuade or compel them to do so. By the 1960s few of the allies were paying serious heed to the official United States policy on trade with the Soviets.

Controlling exports from third countries to the U.S.S.R. of goods and technology originating in the United States is essential to the effectiveness of export control policy. Reexports can be controlled in three ways: first, the third country can control exports to the same degree as the United States does; second, the third country can tolerate or facilitate the assertion of U.S. laws for export control purposes; or, third, the original exports from the U.S. to the third country can be prohibited. Prohibiting U.S. exports to the third country can lead to damage to U.S. economic and political interests, especially if the third country is an important market for the embargoed items.

Foreign governments, quite naturally, view U.S. reexport restrictions on non-U.S. citizens and companies as an infringement of sovereignty. The United States has had serious disputes with other countries when it has attempted to assert extraterritorial jurisdiction in the areas of antitrust, antiboycott, taxation, and export controls over subsidiaries of U.S. companies.

The best alternative is to persuade other major trading countries to adopt the same controls the United States applies to exports. The NATO countries, less Iceland, plus Japan, have implemented a common policy since 1950 through the Coordinating Committee on export controls (COCOM), based in Paris. Each participating country controls the export of items on an agreed list. Representatives meet regularly to discuss difficult cases and "exceptions," and the list itself is reviewed periodically.

The United States controls unilaterally some items not on the COCOM list for national security reasons, but most of the unilateral U.S. export controls are imposed for foreign policy reasons. For example, U.S. controls on exports of oil and gas exploration and production equipment and technology are unilateral controls, although there are signs that the Reagan administration may try to persuade COCOM members to impose similar controls. U.S. export controls imposed for nuclear nonproliferation purposes also lie outside COCOM. Other potential suppliers of nuclear technology apply some controls, but none are as extensive as U.S. controls. No other nation has had anything similar to the controls the United States had placed on exports in order to promote human rights or to oppose international terrorism. U.S. procedures on arms exports for purposes of maintaining regional military balances are also more complex than those of other nations.

The differences in export control policy between the United States and its allies arise in part from differences in responsibilities but more, in my judgment, from differences in perceptions of the world and economic and political interests. The United States, as the strongest Free World power, has an obligation to point the way to effective policies for countering Soviet power. The United States is also the necessary leader of wider international efforts to use economic sanctions against violators of the rules of international law. Whatever one may think of the sanctions against Rhodesia, the embargo-boycott of Uganda, and the selective limits on exports to South Africa, in each case United States participation was critical to the exercise of meaningful restraint on trade with the target nation.

Making allowances for the world leadership role of the United States does not fully account, however, for the more extensive resorting by the United States to export controls. Americans—both in government and industry—seem to put less emphasis on exporting than their counterparts in other countries do.

Preoccupation with the domestic economy has obscured for many Americans the growing share trade has in the U.S. economy and the emerging dependence of the United States upon the world economy. Even the oil shock had the perverse effect of convincing people that the United States must become independent of the rest of the world, rather than forcing recognition that the United States has no choice but to manage better its participation in the world economy.

The United States can do a better job than it has in the past of persuading other nations to join in implementing export and import controls in defense of Western security or in support of international rule of law and morality, but the emphasis must be on persuasion and prior consultation, not coercion. Controls are hard enough to administer when they are based on conviction; feigned cooperation on export controls will not provide the additional margin of security the United States is seeking.

The starting point for a more cooperative policy by the Western powers could be agreement on basic principles for effective and efficient export controls. I offer the following propositions in the hope they will provide the necessary catalyst for consensus.

First, export controls should be focused on achieving specific, attainable, high priority objectives at acceptable cost. Retarding nuclear proliferation and the spread of advanced military systems as well as the spread of capabilities to produce advanced military systems are the highest priorities and the appropriate focus for U.S. export control policy. Controlling exports to obtain leverage on a foreign regime's domestic or foreign policies is problematical and should be embarked upon cautiously. Export controls to inflict punishment on other states (the measures taken after the Afghanistan invasion, for example) can easily cost the punisher as much as the punished. Export controls imposed as symbols of displeasure, on the other hand, are successful by definition; the question is whether the gesture is worth the cost.

Second, export controls must be multilateral to be of optimum effectiveness. The United States is seldom the sole source for the technology, or the commodities or hard currency earnings, needed by a target state. U.S. attempts to assert extraterritorial jurisdiction over foreign subsidiaries of U.S. companies, or the products of U.S. technology, may damage relations with other countries and can lead to less-effective restraint of trade. Effective controls require concerted action by all major potential suppliers, and therefore the United States must pay more attention to building an international consensus and take fewer unilateral actions that generate dissension.

Third, export controls are most effective when they complement cultural or sociopolitical barriers to trade and technology transfers. Those who have struggled for decades to transfer technology to developing countries know all too well the societal impediments to assimilation of modern technological capabilities. Closed societies with large bureaucracies, such as the Soviet Union, may impose upon themselves far greater barriers to innovation and technology assimilation than any export control system that could possibly be devised.

The Soviet Union has achieved its military prowess through consistent, vast expenditures from its huge resource base over many decades. Technology transfer from the West has supplemented the Soviet effort, not "caused" its success. A number of recent publications have claimed that Soviet slavish imitation of Western machinery and weapons, plus the enormous Soviet effort to acquire Western equipment, blueprints, training and so forth, prove that the Soviet Union would not be as advanced as it is militarily without "help" from the West. Such claims attribute to the Soviet Union an ability to acquire and assimilate Western technology—an ability incompatible with the inefficiencies of the Soviet system in developing and applying its own technology.

A comparative analysis of technology transfer and technical progress can help convey an appreciation for the ability of some societies to outlearn and outperform others. The Soviets have done very poorly at using American or other Western technology when compared with Japan, Taiwan, Korea, Brazil, Israel, South Africa and a host of European countries. All have accomplished more in a shorter time with fewer resources than the Soviets. Market economies do consistently better developing and applying technology. Americans, above all, ought to be capable of bearing that truth in mind when assessing how much the Soviets can gain from trade with the West.

Export controls should be designed, when possible, to exacerbate the problems the Soviet Union already faces in developing and applying technology in its military sector. There is far less to be gained from an extensive and expensive Western export control system than is often assumed, simply because the Soviets, on the one hand, do not learn very well from anyone, and on the other hand, they will continue to build their overall military strength at a steady pace despite Western export controls—as they did when the embargo was in full effect in the 1950s.

The strategic parity "pickle" the United States faces is not due to any past laxity in export control policy. Expanding controls on noncritical exports would not be of significant help in meeting the Soviet challenge. Overblown rhetoric about "selling them the rope" with which to hang the capitalists—a reference to a remark attributed to Lenin—nourishes a dangerous illusion that a cheap solution to our military security concerns can be found by tightening export controls. Unfortunately, that is neither cheap nor a solution.

Fourth, the costs of imposing export controls are easily underestimated. There is a tendency in the United States to look only at overall year-to-year national export performance, plus the direct administrative costs of the export control system. Among the hidden costs are: the costs to business of complying with the export-licensing system, the long-term loss of markets due to damage to the supplier's reputation for reliability, the stimulus to foreign competitors to capitalize on the market opportunities foregone by the United States, and the cost of removing export controls once they have become entrenched in bureaucracy and law. Objective cost analyses of export controls might help to curb the government's zeal to restrict exports in response to each unpleasant development abroad.

Fifth, export controls by themselves do not necessarily "work" in the long run in the sense of denying capabilities to an adversary, and can be dangerous if substituted for more effective measures to protect national interests. They treat symptoms, not causes, and are, therefore, inherently second-best approaches. The threat of nuclear proliferation may be put off for a time, for example, by stringent U.S. unilateral controls on exports that might enable additional countries to acquire nuclear weapons, but the forces that drive governments to seek nuclear weapons will not be diminished by export controls alone. Regional and ethnic conflicts, economic distress, and political instability can tempt regimes to spend exorbitant sums to acquire nuclear weapons capabilities. France, China, and India, and perhaps others, have joined the nuclear club despite U.S. export controls. Libya is trying to do so, and Iraq and Israel may also have tried. Export controls can raise the cost and put off the day such countries achieve their goal, but it would be foolish to rely upon export controls alone to stop nuclear proliferation.

Similar reservations apply to the effectiveness of controls on technology transfers to the Soviet Union: controls can slow Soviet technological advance and make it more costly, but they cannot and have not prevented advances in Soviet military capabilities. The military sector comes first in the U.S.S.R. and receives whatever resources Soviet leaders believe it should receive. Soviet defense expenditures have remained on the same growth line despite ups and downs in the Soviet economy. Given the historical record, it is more than a bit naive to think that embargoing exports to the Soviet civilian economy will force them to reduce military expenditures in order to take care of civilian needs.

Preoccupation with controlling exports of technology to the Soviet Union may be a symptom of American overreliance upon a technological "lead" to balance the Soviet Union's larger military defense establishment and expenditures. Maintaining the technological edge the United States has enjoyed to date will require more rapid rates of technological advance in the future. The engines of technological growth in the U.S. civilian sector are increasingly dependent upon vigorous export performance and the international exchange of goods, capital, and technology. Excessive export controls, could isolate American business from the stimulus of international trade and investment, with deleterious effects on the maintenance of U.S. technological leads in the defense sector.

Export controls for purposes of political leverage (as opposed to maintenance of technological superiority) work best against smaller, weak economies that can be isolated from external support. The U.S. embargoes against Cuba, North Korea, Vietnam, and Kampuchea have done nothing to moderate those regimes, and the Soviet Union continues to provide the external support they need. The embargoes do underscore U.S. opposition and force additional costs on the Soviet Union, of course. United Nations sanctions may have helped achieve the evolution of Rhodesia into Zimbabwe and may still help resolve the Namibia situation, but the process is slow, the cost is high, and the determinants are more political than economic. The Unilateral U.S. embargo and boycott of Uganda contributed to the fall of Idi Amin, but in indirect ways not anticipated when the cutoff was adopted by the Congress. The record on the whole suggests that economic restrictions are seldom powerful enough by themselves to induce major political changes. Applied against major powers, export controls are irritants but not "levers."

Sixth, export-control policy must be securely anchored in a domestic consensus in order to be applied and maintained consistently enough to be successful. Switching export controls on and off combines the worst features of both extremes: minimizing the effectiveness of controls while maximizing the economic costs. Wider discussion of the dilemmas of export control policy can help build the necessary consensus, but additional steps may be needed.

Exporters will continue to find the costs of export controls unwelcome and the risk that controls may be precipitously imposed a disincentive to developing export business. The United States may, for foreign policy as well as economic reasons, wish to encourage exports to particular countries or of specific commodities, while retaining the flexibility to cut off exports should circumstances change. Industrial firms, encouraged by the Johnson, Nixon, and Ford administrations to expand their sales to the Soviet Union, found their projects cut off in midstream by the Carter and Reagan administrations, at great cost to the companies. Experience with grain embargoes, by contrast, suggests that domestic political pressures not to adopt controls, or remove them once adopted, can interfere with effective foreign policy.

The concerns of exporters might be reduced if there were a way to compensate U.S. exporters for losses incurred when exports are suddenly cut off. Grain farmers have sought an arrangement to sustain grain prices when exports are restricted for national security or foreign policy (but not short-supply) reasons. One proposal before the Congress would raise agricultural support prices to "parity" during the life of an embargo. Although the proposed compensation may be too generous, the concept could be generalized to apply to any business disrupted by new export controls.

A system of compensation could take a variety of forms. In the case of farmers and other involved in grain exports, the Carter administration attempted to alleviate the costs by purchasing some of the grain that would otherwise have been sold to the Soviet Union. An alternative would be price supports or loan rate increases; similar devices could be used for nonagricultural commodities. Exports of machinery, technology, and services would require a different approach. Insurance could be provided (or required) for exports of sensitive items to sensitive destinations with claims to be paid against confirmed shipments or orders if export controls made performance impossible and the goods had to be sold at a loss. Another approach would be for the U.S. government to assume liability for its own acts of state for purposes of compensating U.S. nationals for export losses. Claims against the U.S. government could be reviewed by the existing Foreign Claims Settlement Commission or by federal courts.

Any system of compensation would have drawbacks, however, not the least of which could be high costs to taxpayers. Exports would still suffer from controls directly and indirectly owing to the loss of "reliable supplier" reputation and displacement by foreign competitors. The availability of compensation could tempt the Federal Government to impose controls not warranted in terms of the national interest or, alternatively, avoid controls due to budgetary concerns when controls might be desirable for broader national purposes. The contribution a compensation scheme could make to a national consensus on export control policy must be carefully assessed, as must considerations of equity and cost. The problem of reconciling controls and the marketplace will not disappear but could perhaps be alleviated.

The six principles discussed above can help the United States achieve an export control policy more effective in serving vital interests, but less costly than the present system. The time is ripe for a comprehensive reconsideration of the advantages and disadvantages of export controls as instruments for achieving U.S. policy objectives. Perhaps the Congress should make a fresh start by passing a single basic statute authorizing export controls, setting priorities, and establishing realistic expectations for export control policy. At the same time, the United States should reassure its allies and other friendly countries that assertions of extraterritorial jurisdiction will be sharply limited if a coherent, effective joint policy on export controls is adopted. Modest expectations and a demonstrated willingness to collaborate seem far more likely to produce results than the recent drift toward "going it alone."

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## THE DAMAGE TO AMERICAN TOURISM FIRMS BY RECENT U.S. TRAVEL BOYCOTTS AND EMBARGOES

### A STUDY BY THE GOVERNMENT AFFAIRS COMMITTEE OF THE U.S. TOUR OPERATORS ASSOCIATION, JUNE 22, 1982

(Submitted for the August 12-13 hearings by Cord D. Hansen-Sturm, Chairman, East Europe Committee, National Foreign Trade Council.)

### SUMMARY

Tourism services sold to Americans became the Soviet Union's number one export in U.S.-Soviet trade in 1981 and probably will continue to lead again this year. Nevertheless, although 50,000 Americans are expected to visit the U.S.S.R. in 1982 (the same as The People's Republic of China), tourism is only half of what it was in 1979 prior to the devastation wreaked by the U.S. 1980 Moscow Olympic travel boycott and the subsequent U.S. transportation embargo of 1981.

American tourism firms will lose an estimated $354 million in sales over a 3-year boycott/embargo period. Almost half of the jobs existing in the predominently New York City based industry in 1979 are non-existent in 1982.

Both the Carter and Reagan Administrations failed in highly publicized diplomatic attempts to persuaded other industrial democracies to impose travel control sanctions during both the Afghanistan and Polish crises. The full economic burden of the West's travel sanctions falls on a small segment of the U.S. tourism industry comprised mostly of regionally specialized small to medium sized firms. European airlines are benefiting from the resurgence of American travel to the U.S.S.R. at the expense of U.S. airlines prevented by their own government from servicing American travelers.

Both the Carter and Reagan Administrations have protected U.S. farmers from the harmful economic effects of foreign policy trade controls through the allocation of billions of dollars in adjustment assistance, and by excluding agriculture from the current package of unilateral U.S. economic sanctions directed at the Soviets and Poles. Thus, within the United States, the cost of foreign policy inspired boycotts and embargoes is concentrated on the exporters of industrial goods and services including the tourism sector.

Limiting the ability of thinking people to cross borders is qualitatively different from controls on grains and machines. Tourism denial policies raise serious constitutional and foreign policy questions above those raised by traditional boycotts and embargoes on goods.

## THE U.S.-U.S.S.R. TOURISM MARKET

The U.S. Assistant Secretary of Commerce for Tourism, at the first meeting of the U.S.-U.S.S.R. Tourism Committee in 1974, predicted that in a favorable political climate, between 230,000 to 300,000 U.S. travelers might be expected to visit the U.S.S.R. in 1980 and 465,000 to 740,000 travelers by 1985. In a subsequent meeting of the bilateral tourism committee, the leading American tour operator predicted that in spite of the unfavorable political and economic conditions in 1979, that with aggressive marketing, U.S. travel to the U.S.S.R. would average 200,000 passengers annually from 1980–1985.

These unrealized estimates were not pipedreams borne of détente euphoria, but the operating assumptions of the political and commercial leaders of the nation's leading services export industry. In the extremely inhospitable political and economic climate of the late 1970s, tourism hovered at 100,000 U.S. travelers to the Soviet Union for 5 years. The industry predicted a realistic increase to 130,000 during the Moscow 1980 Olympic season in the absence of a concerted marketing campaign.

## THE U.S.-MOSCOW OLYMPIC TRAVEL BOYCOTT OF 1980

President Carter on January 4, 1980 announced his intention to impose a U.S. travel boycott on the Moscow Olympics. The United States Tour Operators Association, on behalf of member tour operators threatened with instant insolvency, applied on January 22 to the President and responsible policy officials for adjustment assistance. The tour operators estimated that tourism would drop over 80 percent under a boycott from 97,000 travelers in 1979 to 19,000 in 1980.

For purposes of calculating the financial loss to American tour operators and travel agents, the petitioners conservatively estimated that U.S. travel agents and operators in 1980 grossed $2,000 for each business traveler and $1,500 for each pleasure traveler to the Soviet Union from the continental USA. Receipts from Soviet travel to the USA were minimal, but three Soviet cruise ships operated from U.S. ports under American marketing management.

In 1979, the industry had grossed $173 million. In 1980, under the Olympic travel boycott, the gross plummeted to $54 million on 17,800 travelers, the overwhelming burden of the loss borne by small companies. The industry was devastated, companies were sold, the large multimarket tour operators abandoned the market altogether, and unemployment in New York City, the base of operations for the majority of tour operators in this regional foreign market, soared for bilingual tour managers, operations, and sales personnel as companies slashed staffs in a desperate attempt to regain solvency.

Although the U.S. Government allocated over $2 billion to reduce the shock of the Carter grain embargo to the politically strong U.S. farm community, tour operators were denied adjustment assistance. Over 100 other countries participating in the Moscow Olympics ignored the Carter Administration's call for a world travel boycott, thus forcing the U.S. travel industry, without any government relief, to bear the full brunt of "Western" sanctions.

### THE TRANSPORTATION EMBARGO OF 1981

In 1981, the Reagan Administration also looked to travel controls as a way of signaling displeasure to the Soviet and Polish governments in the wake of the "Solidarity" crisis. All direct bilateral air and maritime travel between the United States and the Soviet Union and Poland was embargoed by the United States. Two American airlines had applied to the CAB for licenses to renew scheduled air service by an American carrier between the United States and the Soviet Union. Both applications were returned. Each company had estimated revenues at about $20 million in the first year of operations. The American cruise line, which had for several years profitably marketed Soviet luxury cruise ships on Atlantic, Caribbean and West Coast runs, lost the ships to European firms at about $25 million per ship per year.

In spite of the travel sanctions, American tourism to the Soviet Union has rebounded from the Olympic travel boycott low of 20,000 and, at an estimated 50,000 American travelers to the Soviet Union in 1982, will probably be for the second year the largest single Soviet export category in bilateral trade with the United States. Because of the overall high level of trade embargo activity by the Reagan Administration, business travel in 1981 and 1982 from the U.S. mainland has stagnated at about 6,000 travelers. Pleasure travel direct from the USA will reach 32,000 and another 22,000 Americans will originate their U.S.S.R. visits from Europe.

Making the extremely conservative assumption that travel would have remained at the 97,000 level in the absence of the Olympic boycott in 1980 and subsequent transportation embargo in 1981, the loss to American tour operators, travel agents, airlines, shipping companies and ground operators, will be $354 million for the 3 year period. As stated at the outset of this report, a realistic potential for this market even under current economic recession conditions and the high level of bilateral U.S.-U.S.S.R. political tension, would have been 200,000 rather than the current 50,000, and under détente conditions could have been double that.

### SOVIET TOURISM LOSSES

This report is about damage to U.S. firms from U.S. economic sanctions against the Soviet Union. The Soviet Union, of course, is also denied export earnings and otherwise harmed by American travel sanctions, but to a lesser extent than U.S. firms for several reasons: (1) Soviet gross receipts from American travel are larger under embargo conditions because anywhere from 10 to 35 percent of American tourists to the U.S.S.R. originate in Europe and are not captured by American wholesale or retail companies; (2) Soviet net foreign exchange earnings are larger because Soviet transportation and ground operator companies enjoy a monopoly on land arrangements on Soviet territory; (3) Soviet cruise ships and airplanes denied access to the United States have been employed by the Soviets in Europe and other hard currency markets. Aeroflot, like other European and Canadian carriers, benefits from the U.S. Government's refusal to license a U.S. air carrier to reopen the abandoned Pan American routes to the U.S.S.R. The 50,000 American travelers are flying to Moscow in 1982 on Soviet, Canadian, and European airlines, with Aeroflot's Canadian operations doing an especially strong business; (4) The huge state owned Soviet travel monopolies have greater staying power than undercapitalized and market specialized American tourism firms. A decrease in U.S.-U.S.S.R. travel is easily absorbable by the Soviets in the face of high European demand for travel to the U.S.S.R. The weakened U.S. tour operators face aggressive attempts by the Soviet foreign tourism monopoly, Intourist, to lessen Soviet dependency on American companies by cutting out the wholesaler and marketing directly through U.S. retail travel agents.

### OTHER POLICY ISSUES

Thinking people crossing borders are vastly different than inert grain and machines. American citizens who exercise their First Amendment right to travel guarantee the continuing viability of our open society. It is understandable that policymakers, with limited means at their disposal to deny economic sustenance and otherwise signal displeasure to an old enemy, might occasionally be tempted to stretch the Constitution and apply controls on people as if they were machines. Travel controls limit human rights and may be in violation of the Helsinki Accords.

Encouraging open borders for travel has been considered good foreign policy by previous U.S. administrations and by other industrial democracies. Tourism strengthens open societies and subverts closed societies.

For the leader of the Western democracies to abandon its previous staunch defense of open borders in favor of travel controls as a form of economic warfare, and be rejected not once but twice in 2 years by all its allies, raises serious questions about foreign policy costs, including lowered international prestige.

### U.S. TRAVEL TO U.S.S.R. 1972–82

[In thousands]

| Year | Business | Pleasure | Total direct U.S.-U.S.S.R. travel [1] | U.S. passport count [2] at Soviet borders |
|---|---|---|---|---|
| 1972 | 11 | 21 | 32 | 72 |
| 1973 | 13 | 27 | 40 | 91 |
| 1974 | 15 | 29 | 44 | 84 |
| 1975 | 15 | 32 | 47 | 98 |
| 1976 | 22 | 44 | 66 | 104 |
| 1977 | 20 | 40 | 60 | 100 |
| 1978 | 21 | 43 | 64 | 102 |
| 1979 | 19 | 38 | 57 | 97 |
| 1980 | 3 | 15 | 18 | 20 |
| 1981 | 6 | 24 | 30 | 39 |
| 1982 | 6 | 32 | 38 | 50 |

[1] Department of Commerce estimates of U.S. citizens whose trip originated in the United States (1972–79). Tourism industry counts (1980–82).

[2] Official Soviet statistics of border entries of U.S. citizens to the U.S.S.R. (1972–79). Industry estimates (1980–81). Intourist estimate (1982).

### U.S.–U.S.S.R. TOURISM

[In millions of dollars]

| Year | Tour operators and travel agents | Airlines | Cruise lines | Ground operators | Industry total |
|---|---|---|---|---|---|
| U.S. tourism industry revenues [1] 1979–83: | | | | | |
| 1979 | 95 | 0 | 75 | 3 | 173 |
| 1980 | 29 | 0 | 25 | 0 | 54 |
| 1981 | 46 | 0 | 25 | 0 | 71 |
| 1982 | 60 | 0 | 0 | 0 | 60 |
| Estimated revenues lost [1] 1980–83: | | | | | |
| 1980 | 66 | 0 | 50 | 3 | 119 |
| 1981 | 49 | 0 | 50 | 3 | 102 |
| 1982 | 35 | 20 | 75 | 3 | 133 |
| Total | | | | | 354 |

[1] Assumption: 97,000 PAX normal travel to U.S.S.R., 57,000 captured by U.S. firms (1979 actual); 8,000 PAX normal travel to U.S.A. (1979 actual). Lost revenues are the difference between 1979 "normal" year revenues and revenues under travel boycott and embargo conditions.

### *Soviet exports of goods and services to the United States, 1981* [1]

**[In millions of dollars]**

| | |
|---|---|
| **Tourism** [2] | 90 |
| **Ammonia** | 78 |
| **Palladium** | 31 |
| **Nickel** | 26 |
| **Naphtha** | 22 |
| **Gold bullion** | 21 |
| **Uranium fluorides** | 11 |
| **Heavy fuel** | 9 |
| **Sable furs** | 8 |
| **Platinum metals** | 6 |

[1] Table for goods exports U.S. Department of Commerce. Tourism export earnings estimated.

[2] Note: U.S. industry revenues at $71 million in 1981 were less than Soviet revenues mainly because they include only U.S. originated travel, and do not include ground operation earnings on U.S. travel from Europe, souvenirs, and those Soviet transportation services used by Americans traveling to the U.S.S.R. via Canada and Europe.

Machinery and Allied Products Institute,
*Washington, D.C., August 20, 1982.*

Hon. Charles McC. Mathias,
*Chairman, Subcommittee on International Economic Policy, Senate Committee on Foreign Relations, Dirksen Senate Office Building, Washington, D.C.*

Dear Chairman McC. Mathias: We welcome this opportunity to present our views on the expanded U.S. export controls on oil and gas equipment, and technical data related thereto, destined for the Soviet Union, and request that our presentation be included in the record of the recent hearings on this subject.

The Machinery and Allied Products Institute is the national organization of capital goods and allied product manufacturers. Its membership includes a broad range of producers of machinery (electrical and nonelectrical), industrial equipment, oil field equipment, components, electronics, scientific and industrial instruments, controls, forgings, testing equipment, etc. Our membership is heavily involved in foreign markets through exports, direct investment, and licensing agreements.

Our position is first summarized and then presented in more detail.

## SUMMARY OF POSITION

The principal thrust of our position is that the export controls on goods and technology for the construction of oil or gas pipelines or pipeline facilities will not accomplish any useful purpose. Indeed, it is our belief that "foreign policy" controls in general have not been successful in advancing U.S. interests and the costs of such controls are substantial in diplomatic and economic terms. We realize that the adverse effect on U.S. business cannot be the sole or perhaps even determining factor in arriving at major foreign policy decisions. However, if our basic premise is correct, the interests of the United States are not well served by restricting U.S. business' participation in international sales of products covered by the controls.

## IMPACT OF THE CONTROLS

*MAPI interest.*—Many of our member companies produce equipment for the petroleum and natural gas industries from exploration through refining. A significant number of these companies are adversely affected by the Executive branch's controls directed against the Soviet petroleum and natural gas industries, including the planned pipeline to Western Europe.

A number of our member companies also are affected by the government's suspension of all approvals for exports—or reexports—of products and technical data to the Soviet Union and Poland. This "freeze" affects of course exports to Soviet petroleum and natural gas projects other than pipeline activities, and exports not only of "high technology" but any technology.

*Uncertainty re the objectives of the controls.*—As is not infrequently the case, the specific objectives of the controls against the Soviet Union are not clear. One objective—stated when the controls were expanded in June—is "to advance reconciliation in Poland." In addition, the Administration has expressed opposition to the pipeline on the grounds that the pipeline would increase European dependence on the Soviet Union and would provide the latter with a new, major source of foreign exchange. As to the former, we doubt that any student of Soviet and communist affairs would agree that unilateral U.S. sanctions against the Soviet Union are likely to influence developments in Poland, and the Subcommittee may want to obtain private expert views on this point. As for European dependence on the Soviet Union, the proportion of their total energy requirements to be accounted for by the pipeline would appear manageable and, being far more dependent on imports of energy than the United States, those countries place a high priority on diversifying their foreign sources.

Still another objective mentioned frequently in the press, and attributed to the Administration, is that the action was taken to punish European countries for not going as far as the Administration wanted in restraining credit to the Soviet Union. If this is an objective, it appears that the greatest "punishment" will be inflicted on U.S. firms and their foreign affiliates and that the U.S. action is excessive in view of the agreement achieved in June under the aegis of the Organization for Economic Cooperation and Development (OECD) to increase substantially the minimum interest rates on government-supported financing for exports destined for the Soviet Union.

*The cost of the controls.*—We find no reason to believe that these controls will be any more successful than other foreign policy controls in advancing U.S. interests and the cost—in terms of U.S. political and economic interests—may be substantial:

While many views are offered in the United States as to how the Europeans should address their energy problems, it is clear that the European countries have decided that the pipeline is in their interest. It also is clear that European heads of government consider the pipeline a major matter of national interest. We have not seen convincing evidence that either the Europeans or the Soviet Union will be detered from going forward with the project because of U.S. controls. The role of U.S. suppliers and U.S.-affiliated suppliers in Europe and Japan will simply be filled by foreign producers.

The U.S. controls, particularly those implemented on June 22, represent another instance of extraterritorial application of U.S. law that is becoming increasingly objectionable to foreign governments. The June 22 controls not only apply retroactively to transactions by U.S. affiliates abroad contracted for prior to June 22, but also apply to locally incorporated firms "owned or controlled" by any person subject to the jurisdiction of the United States. The United Kingdom government already has announced that it considers the U.S. action "unacceptable to the U.K. Government and, in the Government's view, in international law" [1] and has invoked the Protection of Trading Interests Act of 1980.[2] Other European governments are following suit. In addition to being ineffective, the U.S. controls will result in diplomatic tensions with other friendly trading nations and difficulties for U.S.-affiliated firms "caught in the middle."

The controls serve as another vivid reminder—for European and Japanese firms, as well as their governments—of the difficulties which increasingly flow from association with U.S. firms. An association with a U.S. firm (whether as customer, investment partner, or licensee) already involves a great deal of U.S. foreign policy "baggage"; e.g., controls against a number of Communist countries; controls against Libya, South Africa and certain countries accused of supporting international terrorism; U.S. antiboycott programs; and the Foreign Corrupt Practices Act.

## OTHER ISSUES

Since December 30, 1981, the Executive branch has suspended processing applications for all exports and reexports of products and technical data to the Soviet Union and, since June 22, the same policy has applied to Poland.

These controls affect MAPI member companies in broad areas in addition to pipeline activity:

The suspension of licensing has of course stopped exports of equipment and technical data related to Soviet oil and natural gas exploration, production and refinement, as well as transmission. It is our understanding that the Carter administration concluded only a few years ago that it was not in the national interest to attempt to restrain Soviet—or any other country's—production of energy resources. How has the Reagan Administration justified this shift in policy?

Since Department of Commerce regulations require the Department's approval for all transfers of "technical data not generally available" (i.e., proprietary technical data) to the Soviet Union (and most other Communist countries), the current suspension prevents transfers not only of "high technology" but any technology. Thus it prevents transfers—by foreign holders of U.S. data as well as by U.S. firms—of data which is not of national security significance and unrelated to Soviet energy projects.

Since the prohibition on approvals applies to reexports of products to the Soviet Union, foreign holders of U.S. products also are affected. Thus, as in nearly every instance when U.S. export controls are invoked, a network of foreign customers in third countries is adversely affected by unilateral U.S. export controls.

## CONCLUDING COMMENTS

In its deliberations concerning the expanded controls against the Soviet Union, and in preparation for extension and amendment of the Export Administration Act next year, we suggest that the Subcommittee address the following matters:

What evidence is there that "foreign policy" controls imposed by the United States have actually advanced U.S. interests in any way commensurate with their costs? With such controls again proliferating, we believe this is a subject that deserves major attention by the Subcommittee before next year's review of the Export Administration Act.

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[1] Press Release issued by the British Information Department, British Embassy, Washington, D.C., June 10, 1982.

[2] The Protection of Trading Interests Act of 1980 was adopted initially as a response to repeated extraterritorial application of U.S. law.

Is it in the national interest for the United States—which has not had a balance-of-trade surplus since 1975, has over 10.5 million unemployed, and has major industries severely damaged by foreign competition in the U.S. domestic market—to continue to use export controls to "punish" foreign countries? Given the worldwide availability of nearly all affected products, the greatest punishment is inflicted on the U.S. exporter. In our view, the United States' repeated resort to export controls when there is public pressure to "do something" is due to (1) a habitual response developed in the immediate post-World War II years when U.S. economic power was much more predominant than it is today, and (2) the fact that the President has the power to restrict exports for reasons other than national security.

This concludes our comments. We commend the Chairman and the Subcommittee staff for addressing an issue that greatly concerns a substantial number of U.S. exporters.

Sincerely,

CHARLES W. STEWART, *President.*

**Petroleum Equipment Suppliers Association**

William J. Sallans
Executive Vice President

9225 Katy Freeway Suite 401
Houston, Texas 77024
713/932-0168

October 6, 1982

The Honorable Charles Percy
Chairman
Senate Committee on Foreign Relations
The United States Senate
Washington, D.C. 20510

Dear Senator Percy:

We are writing to you because of your interest and concern in the areas of international trade and foreign policy. The Petroleum Equipment Suppliers Association, which represents 335 companies who are manufacturers, service and supply companies serving the petroleum industry, is gravely concerned about the imposition of trade sanctions on oil and gas equipment to the U.S.S.R.

We believe our preeminence and technical superiority in the world marketplace, achieved through hard work, ingenuity and quality products, has been misinterpreted by some. It should be clearly understood that the U.S. is no longer the nearly exclusive supplier of petroleum equipment to the world it once was. This fact is well documented by the enclosed partial compilation of non-U.S. manufacturers of petroleum equipment, listing some 600 foreign firms producing petroleum equipment.

The adverse impact of these sanctions to our industry is already affecting sales and jobs, but of even greater concern to us is the long term effect on U.S. industry's competitiveness in world markets. This loss of markets for our industry due to the present availability of comparable foreign petroleum equipment and the criticism of the unreliability of U.S. companies is a very serious concern.

We strongly believe that trade sanctions, particularly when taken unilaterally, are an ineffective and often counterproductive tool for achieving foreign policy objectives. Our nation's preeminent position in the world marketplace can be irreparably damaged as a result of the improper use of trade sanctions in the conduct of American foreign policy.

Sincerely,

PETROLEUM EQUIPMENT SUPPLIERS ASSOCIATION

William J. Sallans
Executive Vice President

WJS:ns
Enclosure

# Compilation of Non–U.S. Manufacturers of Petroleum Equipment

August 1982

PETROLEUM EQUIPMENT SUPPLIERS ASSOCIATION
9225 Katy Freeway, Suite #401
Houston, Texas 77024

# Non-U.S. Sources of Petroleum Equipment

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Non-U.S. Manufacturers of Petroleum Equipment by:

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Addendum to Product Category A-1

Addendum to Country of Origin B-1

N.B. The efficacy of an embargo is a function of the degree of availability of the items embargoed. For all too long, there has existed a lack of information regarding the foreign availability of petroleum equipment. The list which follows is not meant to be taken as complete or exhaustive. In enumerating more than 500 companies capable of producing more than 2,000 product categories similar to those available from U.S. based producers, it becomes apparent that the effectiveness of any program of product denial can not hope to be effective. It should be noted that no U.S. owned or controlled plants were knowingly included in these lists.

# Non-U.S. Sources of Petroleum Equipment

## By Product Category

### ABSORBERS - Glycol Dehydrator:

Adamson & Hatchett
Creusot-Loire/Pressure Vessels Div.
C. Goldhan
Robert Jenkins Oil & Gas
Phoceenne De Metallurgie
Siirtec

### ABSORBERS - Power:

Dowty Offshore Ltd.

### ABSORBERS - Shock, Drilling:

Cougar Tool
Griffith Oil Tool, Ltd.
Offshore Drilling Supplies, Ltd.
Sigma Chemie Ltd.

### ABSORBERS - Shock, Vibration:

BTR Silvertown, Ltd.
Sigma Chemie Ltd.
T. I. Group

### ACCELEROMETERS:

Ferranti Ltd.

### ACCUMULATORS:

Creusot-Loire/Pressure Vessels Div.
Porta-Test Mfg. Ltd.

### ACCUMULATORS - Hydraulic:

Automotive Products Ltd.
BTR Silvertown, Ltd.
Brisco Engineering, Ltd.
Dowty Offshore, Ltd.
Hydraudyne B. V.
Industrialexportimport
Rotator Norway

### ACID - Inhibited Hydrochloric:

Chemische Fabriek Servo
Servecio Hydrocarb

### ACID - Well Stimulation:

Chemische Fabriek Servo
Servecio Hydrocarb

### ACTUATORS - Differential Pressure:

Kurt Kohorn, Ltd.

### ACTUATORS - Valve:

Alfred Wirth & Co. KG
Automotive Products, Ltd.
Barber Industries, Ltd.
Costruzioni Hydro-Pneumatic
France Operator
GEC-Elliott Control Valves, Ltd.
Kurt Kohorn, Ltd.
Lanzagorta/FIP
Rotator Norway
Saut Du Tarn
Serck Audco Valves

### ADAPTERS - Bottom Hole Test:

Canada Works
Lanzagorta/FIP

### ADAPTERS - Flanged:

Breda Fucine
Canada
Lanzagorta/FIP

### ADAPTERS - Packoff:

Canada
Canada Works
Lanzagorta/FIP
Venequela Oil Tool

### ADAPTERS - Tubing Head:

Breda Fucine
Canada
Lanzagorta/FIP

### ADAPTERS - Wellhead:

Breda Fucine
Canada
Lanzagorta/FIP
Van Der Horst

### ADDITIVES - Drilling Mud:

Anchor Drilling Fluids A/S
CECA 1
Hercules France S.A.
Hoechst AG
Norsk Hydro
Sachtleben Chemie
Scholten
Sigma Chemie, Ltd.

ADDITIVES - Fracturing Fluids:
Hoechst AG
Servecio Hydrocarb
Sigma Chemie, Ltd.

ADSORBERS:

Adamson & Hatchett
Creusot-Loire/Pressure Vessels Div.

ADSORBERS - Dry Desiccant:

Robert Jenkins Oil & Gas
Sigma Chemie, Ltd.

AGENTS - Anti-Foaming:

Anchor Drilling Fluids A/S
CECA II

Chemische Fabriek Servo BV
Sigma Chemie, Ltd.

AGENTS - Cement:

CECA I
Sigma Chemie, Ltd.

AGENTS - Cleaning:

Chemische Fabriek Servo BV
Sigma Chemie, Ltd.
Unitor Ships Services

AGENTS - Foaming:

CECA I
Chemische Fabriek Servo
Sigma Chemie, Ltd.

AGENTS - Friction Reducing for Oil, Water, Acid:

Anchor Drilling Fluids A/S
CECA I
Sigma Chemie, Ltd.

AGENTS - Surface-Tension Reducing:

Anchor Drilling Fluids A/S
CECA I
CECA II
Chemische Fabriek Servo
Sigma Chemie, Ltd.

AGENTS - Temporary Plugging or Diverting:

CECA I
Sigma Chemie, Ltd.

AGENTS - Water Control:
Anchor Drilling Fluids A/S
Chemische Fabriek Servo BV
Hoechst AG
Sigma Chemie, Ltd.
Unitor Ships Services

AGITATORS:

Bharat Heavy Electricals, Ltd.
Dreco, Ltd.

AIDS - Navigation:

Ferranti, Ltd.
Thomson - CSF AVS

AIR CONDITIONING - Equipment:

G K N Group
Unitor Ships Services

ALARMS - Flow:

Barber Industries, Ltd.
Rognon S. A.
Samega

ALARMS - Level:

Barber Industries, Ltd.
C. Goldhan
Samega

ALARMS - Lost Circulation:

Samega

ALLOYS - Abrasion & Corrosion Resisting:

Compagnie
Sandvik AB
Vallourec Export

ALTERNATORS:

Bharat Heavy Electricals, Ltd.
Elektro Union Offshore A/S
GEC Machines
Rognon S.A.

AMPLIFIERS - Parametric:

Ferrenti, Ltd.

ANALYSIS - Reservoir:

Basset-Bretagne-Loire
Flopetrol
Geomecanique
Tesel Services, Ltd.

ANCHORS - Casing Pump:

Ceria B
S.B.S.

ANCHORS - Dead Line:

Ceria
Dreco, Ltd.

ANCHORS - Earth, Guy Wire, Rock:

Ceria

ANCHORS - Hold Down:
Bolland & Cia
A/S Raufoss
S.B.S.
Vereinigte Edelstahlwerke
ANCHORS - Insert Pump:
Bolland & Cia
S.B.S.
Vereinigte Edelstahlwerke
ANCHORS - Multiple String:

Bruce International
Venezuela Oil Tool

ANCHORS - Offshore Embedment:

A/S Raufoss
Bruce International
G K N Group
Hamanaka Chain Mfg. Co., Ltd.
Irgens Larsen A.S.
Linnenbank International, Inc.

ANCHORS - Tubing:
Geomecanique
Venezuela Oil Tool
Vivalo
ANODES:

G K N Group

ANTENNAS:

Thomson - CSF AVS

APPARATUS - Breathing, Underwater:

Comex Industries
Unitor Ships Services

ARRESTORS - Flame:

C. Goldhan
Unitor Ships Services

ASSEMBLES - Wellhead Injection:

Lanzagorta/FIP

ATTACHMENTS - Sucker Rod, On & Off
Bolland & Cia
Canada
Ceria B
S.B.S.
ATTACHMENTS - Tubing Head:

Lanzagorta/FIP

BACTERICIDES:

Anchor Drilling Fluids A/S
Chemische Fabriek Servo
Sigma Chemie, Ltd.
Unitor Ships Services

BAILERS - Hydrostatic:

Flopetrol

BALANCERS - Mud:

Anchor Drilling A/S
Kingston Instrument Co., Ltd.

BALLAST UNITS:

Anchor Drilling Fluids A/S
Ateliers et Chanteirs de Bretagne

BALLS & SEATS:
Bolland & Cia
S.B.S.
Vereinigte Edelstahlwerke
BANDS - Protective, Tool Joint:

Lion Oil Tool

BANDS - Wire Rope & Cable:

G K N Group

BARGES:

Ateliers et Chanteirs de Bretagne

BARITES:

Anchor Drilling Fluids A/S
CECA I
Edemsarda SpA
Norcem
Sachtleben Chemie

BARRELS - Core, Diamond:

Diamant Boart S.A.
J. K. Smit & Sons

BARRELS - Core, Rotary:

Diamant Boart S.A.
Industrialexport

BARRELS - Core, Wire Line:

Ceria
Diamant Boart S.A.
Tesel Services, Ltd.

BARRELS - Working:

Diamant Boart S.A.

BARS - Hollow Rod:

G K N Group

BARS - Sinker:

Flopetrol
Friedrich Leutert GmbH & Co.
Massarenti
Venezuela Oil Tools

BARS - Steel:

G K N Group
Sandvik AB
T. I. Group

BASKETS - Bridging:

Sea Oil Services, Ltd.

BASKETS - Cementing:

J. Caslake, Ltd.
Sea Oil Services, Ltd.

BASKETS - Fishing, Cone, Junk, Magnetic, Etc:

Drillcon Industries, Ltc.
Equipetrol S.A.
Offshore Drilling Supplies Limited
Sea Oil Services, Ltd.
Tesel Services, Ltd.
Vereinigte Edelstahlwerke AG

BASKETS - Reverse Circulating

Offshore Drilling Supplies Limited
Unitor Ships Services

BATTERIES - Offshore:

Dowty Offshore, Ltd.

BEACONS - Navigational:

Thomson - CSF AVS
Thomson - CSF (DASM)
Unitor Ships Services

BEAMS - Walking:

Salzgitter Maschinen

BEANS - Flow, also see Chokes:

Brisco Engineering, Ltd.
Canada
Kingston Instrument Co., Ltd.
Lanzagorta/FIP

BELL - Diving:

Comex Industries

BELL - Observation, Subsea:

Comex Industries

BELTS - Derrick Safety:

Hendrik Veder
Offshore Drilling Suppliers Limited

BELTS - Rubber

Arntz-Optibelt-KG
Colmant Cuvelier
Fenner & Co., Ltd., J.H.
Industrie Pirelli S.p.A.
Kleber-Colombes
Mitsuboshi Belting, Ltd.

**BELTS - Rubber (contd.)**

Moller-Werke GMBH
Peter-BTR, Gummiwerke AG
Roulunds Fabriker, Ltd.
Semperit Aktiengesellschaft
Trelleborg, Inc.
Wigglesworth & Co., Ltd.,

**BELTS - Vacuum Filter:**

CECA I
Edemsarda SpA
Hercules France S.A.

**BINDERS - Load:**

Ansell, Jones & Co., Ltd.

**BITS - Big Hole:**

Industrialexport
SMFI/Creusot-Loire
Salzgitter
Sea Oil Services, Ltd.

**BITS - Carbide Insert:**

Industrialexport
Okgt
SMFI/Creusot-Loire
Sea Oil Services, Ltd.
Tsukamoto Seiki Co. Ltd.

**BITS - Core:**

Cristal Profor S.A.
Diamant Boart S.A.
Drilling & Service
Industrial & Mining Bit Mfg.
SMFI/Creusot-Loire
Sea Oil Services, Ltd.
J. K. Smit & Sons

**BITS - Diamond:**

Cristal Profor S.A.
Diamant Boart S.A.
Drilling & Service
Industrial & Mining Bit Mfg.
SMFI/Creusot-Loire
Sea Oil Services, Ltd.
J. K. Smit & Sons
Tsukamoto Seiki Co., Ltd.

**BITS - Directional:**

Diamant Boart S.A.
Drilling & Service

**BITS - Directional (contd.)**

Okgt
SMFI/Creusot-Loire
Sea Oil Services, Ltd.
J. K. Smit & Sons
Tsukamoto Seiki Company

**BITS - Down Hole Motors:**

Diamant Boart S.A.
J. K. Smit & Sons

**BITS - Expanding:**

Diamant Boart S.A.
Okgt

**BITS - Jet:**

Drilling & Service
SMFI/Creusot-Loire
Sea Oil Services, Ltd.
Tsukamoto Seiki Company

**BITS - Mining:**

Diamant Boart S.A.
Drilling & Service
Industrial & Mining Bit Mfg.
Sea Oil Services, Ltd.
J. K. Smit & Sons
Tsukamoto Seiki Company

**BITS - Percussion:**

SMFI/Creusot-Loire

**BITS - Rotary**

Cristal Profor S.A.
Diamant Boart S.A.
Drilling & Service
Fabriven De Venezuela
Industrialexport
Norsea A/S
SMFI/Creusot-Loire
Sea Oil Services, Ltd.
Tsukamoto Seiki Company

**BITS - Rotary and Drag:**

Creusot-Loire
Diamant Boart S.A., Machine Div.
Intreprinderia "1 Mai"
Sekiyu Sakuseiki Seisaku K. K.
Tsukamoto Seiki Company, Ltd.

BITS - Steel Tooth Type:

Industrialexport
SMFI/Creusot-Loire
Tsukamoto Seiki Company
Unitor Ships Service A/S

BLADES - Drill Bit:

Diamant Boart S.A.

BLADES - Stabilizer & Reamer:

Diamant Boart S.A.
Griffith Oil Tool, Ltd.
Lion Oil Tool
Offshore Drilling Suppliers Limited
C. H. Taylor & Co., Ltd.
Tsukamoto Seiki Company

BLOCK-HOOKS:

Ansell, Jones & Co., Ltd.
Bharat Heavy Electricals, Ltd.
Hendrik Veder
Industrialexport
Lanzagorta/CM
Vereinigte Edelstahlwerke AG

BLOCKS - Brake:

Offshore Drillling Supplies Limited
Vereinigte Edelstahlwerke AG

BLOCKS - Crown:

Ansell, Jones & Co., Ltd.
Lanzagorta/CM
Olympic Ironworks, Ltd.

BLOCKS - Floor:

Ansell, Jones & Co., Ltd.
Flopetrol

BLOCKS - Gin Pole:

Ansell, Jones & Co., Ltd.
Flopetrol
Griffith Oil Tool, Ltd.

BLOCKS - Lead Impression:

Flopetrol
Lion Oil Tool

BLOCKS - Snatch:

Ansell, Jones & Co., Ltd.
Bharat Heavy Electricals, Ltd.
Hendrik Veder

BLOCKS - Traveling:

Ansell, Jones & Co., Ltd.
Bharat Heavy Electricals, Ltd.
Blohm & Voss AG
Industrialexport
Lanzagorta/CM
Rauma-Repola Oy, Pori Works
Tri-Service Machine, Ltd.
Unitor Ships Service AS

BLOCKS - Tubing:

Ansell, Jones & Co., Ltd.

BLOCKS - Wire Line:

Ansell, Jones & Co., Ltd.
Ceria
Hendrik Veder
Industrialexport

BOATS - Tug, Tow, Crew, Cargo, Etc.:

Ateliers et Chanteirs de Bretagne

BOLTS - Alloy Steel, Etc.:

Doncasters Moorside, Ltd.
Elkem-Spigerverket A/S
G K N Group

BOLTS - Hydraulically Operated:

Doncasters Moorside, Ltd.
G K N Group

BOWLS - Casing:

Sea Oil Services, Ltd.

BOXES - Stuffing, Pipe:
Bolland & Cia
Canada
Flopetrol
Seaco
Suplidora Nacional CA
BOXES - Stuffing, Tubing:
Bolland & Cia
Canada
Seaco
Suplidora Nacional CA

BRAKES - Air, Drilling Rig:

T. I. Group
Vereinigte Edelstahlwerke AG

BRAKES - Disc:

Pusnes Mekaniske Verksted
T. I. Group

BRAKES - Drawworks, Fluid:

T. I. Group

BRAKES - Pneumatic:

Renold, Ltd.
T. I. Group

BRAKES - Winch:

Ceria
T. I. Group

BREAKERS - Bit:

Diamant Boart S.A.
Lion Oil Tool
Sea Oil Services, Ltd.

BREAKERS - Circuit:

Elektro Union Offshore A/S

BREAKERS - Pneumatic:

Atlas Copco AB

BRUSHES - Wire:

Unitor Ships Service A/S

BUOYS:

Ateliers et Chanteirs de Bretagne
Irgens Larsen A.S.

BUOYS - Seismic:

Dowty Offshore, Ltd.

BURNERS - Crude Oil:

Flopetrol
Porta-Test Systems, Ltd.

BURNERS - Offshore Oil:

Flopetrol

BURNERS - Production Testing:

Flopetrol
Porta-Test Systems, Ltd.

BUSHINGS - Casing Head:

Lanzagorta/FIP

BUSHINGS - Kelly:

Industrialexport

BUSHINGS - Master:

Bharat Heavy Electricals, Ltd.
Industrialexport

CABLE - Electrical:

Elektro Union Offshore A/S
Jeumont-Schneider
North Sea Exploration Services

CABLE - Electrical Handling Equipment:

Dowty Offshore, Ltd.
Societa Cavi Pirelli

CAGES - Sub-Surface Pump:

Vereinigte Edelstahlwerke

CALIPERS - Casing & Tubing:

SMFI/Creusot-Loire

CALIPERS - Open Hole:

Tesel Services, Ltd.

CAMERAS - Underwater:

North Sea Exploration Services

CAPSTANS - Electric:

Ceria
Clarke Chapman, Ltd.
Wharton Engineers

CAPSULES - Survival Offshore:

Comex Industries

CARBOXYMETHYLCELLULOSE:

CECA I
Hoechst AG
Scholten

CARRIERS - Blowout Preventers:

Ceria
A. S. Normar

CASING - Electric Weld:

Hamblin & Glover Oilfield Services, Ltd.
Hoesch Roehrenwerke
Nippon Kokan
Offshore Drilling Supplies Limited
Sumitomo Metal Industries
United Casing Steel & Pipe, Ltd.
Unitor Ships Services A/S

CASING - Fiberglass:

Hamblin & Glover Oilfield Services, Ltd.
Sepma

CASING - Flush Joint

The Algoma Steel Corp.
Hamblin & Glover Oilfield Services, Ltd.
Nippon Steel Corp.
Vallourec Export

CASING - Integral Joint:

The Algoma Steel Corp.
British Steel Corp.
Dalmine
Hamblin & Glover Oilfield Services, Ltd.
Mannesmannrohren-Werke
Nippon Steel Corp.
Vallourec Export

CASING - Oil & Gas Well:

The Algoma Steel Corp.
British Steel Corp.
Dalmine
G K N Group
Hamblin & Glover Oilfield Services, Ltd.
Hoesch Roehrenwerke
Kawasaki Steel Corp.
Mannesmannrohren - Werke

CASING - Oil & Gas Well: (contd.)

Nippon Kokan
Offshore Drilling Suppliers Limited
Sumitomo Metal Industries
Vallourec Export

CASING - Shot Hole:

British Steel Corp.
Hamblin & Glover Oilfield Services, Ltd.
Nippon Steel Corp.

CASING - Slip Joint:

Dalmine
Hamblin & Glover Oilfield Services, Ltd.

CASING - Spiral Grooved:

Hamblin & Glover Oilfield Services, Ltd.

CASING - Spiral Welded:

Hamblin & Glover Oilfield Services, Ltd.
Hoesch Roehrenwerke
Nippon Steel Corp.

CATCHERS - Junk:

Offshore Drilling Suppliers Limited
Tesel Services, Ltd.
Venezuela Oil Tool

CATWORKS:

Lanzagorta/CM

CELLS - Calibrating:

Flopetrol

CEMENT - Gel:

CECA I

CEMENT - Gypsum:

CECA I

CEMENT - High Density:

CECA I

CEMENT - Low Water Loss:

CECA I

CEMENT - Low Density:

CECA I
Italcementi

CEMENT - Well, Retarded:

CECA I
Italcementi
Norcem

CEMENTING - Equipment:

CVB Industrial Metanica
Equi-Petrol

CEMENTING-LINER:

Sea Oil Services, Ltd.

CEMENTING - Turbulent Flow:

Sea Oil Services, Ltd.

CENTRALIZERS - Casing:

J. Caslake, Ltd.
Offshore Drilling Suppliers Limited
Regal Industrial Rubber C.A.
Sea Oil Services, Ltd.
Silvio Ballerini & C.
Site Oil Tools, Ltd.

CENTRALIZERS - Contact:

Sea Oil Services, Ltd.

CENTRALIZERS - Directional Hole:

J. Caslake, Ltd.
Sea Oil Services, Ltd.

CENTRALIZERS - Drill Pipe:

Regal Industrial Rubber C.A.
Sea Oil Services, Ltd.

CENTRALIZERS - Liner:

J. Caslake, Ltd.
Regal Industrial Rubber C.A.
Sea Oil Services, Ltd.

CENTRALIZERS - Multiple String:

Sea Oil Services, Ltd.

CENTRALIZERS - Tubing:

J. Caslake, Ltd.
Regal Industrial Rubber C.A.
Sea Oil Services, Ltd.

CHAIN & SPROCKETS:

Amsted-Siemag Kette GmbH
Bharat Heavy Electricals, Ltd.
Compagnie Des Transmissions Mecaniques
Daido Kogyo Co., Ltd.
Ewart Chainbelt Co., Ltd.
Franz Kohmaier K.G.
Pulton Chain Co., Inc.
Tsubakimoto Chain Mfg. Co., Ltd.

CHAINS - Hoist & Drive:

Ceria
Hendrik Veder

CHAINS - Mooring:

Bulten-Kanthal AB
Hamanaka Chaim Mfg. Co., Ltd.
Japan Mechanical Chain Mfg. Co.
Ljusne (LW) Chain
Nippon Chain & Anchor Co., Ltd.
Norbrit-Pickering Limited
Vicinay, S.A.

CHAINS - Roller:

Amsted-Siemag Kette
Renald, Ltd.
Sedis Industrie

CHAINS - Spinning:

Offshore Drilling Supplies Limited

CHAMBERS - Hyperbaric:

Comex Industries

CHAMBERS - Recompression:
Comex Industries

CHART READERS:
Friedrich Leutert GmbH & Co.

CHARTS - Bottom Hole Pressure Guage:
Friedrich Leutert GmbH & Co.

CHEMICALS:
Empresos Mito Juan

CHEMICALS - Corrosion Inhibiting:
CECA I
CECA II
Hoechst AG

CHEMICALS - Corrosion Inhibiting (contd.)

Chemische Fabriek Servo
Unitor Ships Services A/S

CHEMICALS - Demulsifying:

Anchor Drilling Fluids A/S
CECA I
CECA II
Chemische Fabriek Servo
Hoechst AG
Unitor Ships Service A/S

CHEMICALS - Desalting:

Anchor Drilling Fluid A/S
CECA II
Chemische Fabriek Servo
Hoechst AG
Sigma Chemie, Ltd.

CHEMICALS - Formation Stabilizers:

CECA II
Hoechst AG

CHEMICALS - Hydrate Preventions:

Anchor Drilling Fluids A/S
Hoechst AG
Sigma Chemie, Ltd.

CHEMICALS - Mud Removal Dispersant:

CECA I

CHEMICALS - Paraffin Inhibitor:

CECA II
Chemische Fabriek Servo

CHEMICALS - Paraffin Removing:

CECA II
Chemische Fabriek Servo

CHEMICALS - Polymers:

Anchor Drilling Fluids A/S
CECA I
CECA II
Chemische Fabriek Servo BV
Hoechst AG
Scholten
Sigma Chemie, Ltd.

CHEMICALS - Scale Preventive:

CECA II
Chemische Fabriek Servo

CHEMICALS - Waterflood:

Chemische Fabriek Servo
Hoechst AG

CHOKES - Adjustable:

Breda Fucine
Canada
Kurt Kohorn, Ltd.
Lanzagorta/FIP

CHOKES - Automatic:

Kurt Kohorn, Ltd.

CHOKES - Bottom Hole:

Kurt Kohorn, Ltd.
Seaco

CHOKES - Heater:

Kurt Kohorn, Ltd.
Lanzagorta/FIP

CHOKES - Hydraulically Operated:

Brisco Engineering, Ltd.
Kurt Kohorn, Ltd.

CHOKES - Plug, Pumpdown:

Kurt Kohorn, Ltd.

CHOKES - Positive:

Breda Fucine
Canada
Lanzagorta/FIP

CHROMATOGRAPHS:

Samega

CLAMPS - Cable:

Ceria
United Ropeworks

CLAMPS - Casing:

J. Caslake, Ltd.

CLAMPS - Deadline Anchor:

Ceria

CLAMPS - Pipe:

Creusot-Loire Energie Developments
Hydraudyne B.V. & Phoceenne De Metallurgie
Kurt Kohorn, Ltd.

CLAMPS - Pipe Repair:

Ceria
Kurt Kohorn, Ltd.
Phoceenne De Metallurgie

CLAMPS - Polished Rod:

Ceria B

CLAMPS - Safety:

Vereinigte Edelstahlwerke

CLAMPS - Tubing:

T. I. Group

CLAMPS - Wireline:

Ceria
United Ropeworks

CLEANERS - Cold Water:

Unitor Ships Service A/S

CLEANERS - Detergent:

Chemische Fabriek Servo
Unitor Ships Service A/S

CLOCKS - Bottom Hole Gage:

Friedrich Leutert GmbH & Co.

CLOTHING - Coveralls, Pants, Shirts, Jackets:

Unitor Ships Service A/S

CLUTCHES - Air Actuated:

Renold, Ltd.
T. I. Group

CLUTCHES - Friction:

T. I. Group

CLUTCHES - Hydraulic:

T. I. Group

CLUTCHES - Mechanical:

T. I. Group

COATINGS - Drill Pipe:

Hoechst AG

COATINGS - Pipe Protective:

CECA II
Hoechst AG
Hoesch Roehrenwerke

COATINGS - Plastic:

Mannesmannrohren-Werke

COATINGS - Thread:

Unitor Ships Service A/S

COATINGS - Tubing:

Sofresid

COCKS - Kelly:

Hermann von Rautenkranz, Internationale Tiefbohr GmbH & Co., KG, ITAG
Offshore Drilling Suppliers Limited
SMF International, Group Creusot-Loire

COLLARS - Baffle:

Sea Oil Services, Ltd.
Site Oil Tool, Ltd.

COLLARS - Casing Fill-Up:

Equipetrol S.A.
Sea Oil Services, Ltd.
Site Oil Tool, Ltd.

COLLARS - Cementing:

Sea Oil Services, Ltd.

COLLARS - Die:

Sea Oil Services, Ltd.

COLLARS - Drill:

Breda Fucine
Equipetrol S.A.
G K N Group
Itag Celle
Lion Oil Tool
Offshore Drilling Supplies Limited
SMFI/ Marep
Sea Oil Services, Ltd.
C. H. Taylor & Co., Ltd.
Van Der Horst
Vereinigte Edelstahlwerke

COLLARS - Drill, Grooved:

Breda Fucine
SMFI/ Marep
Sea Oil Services, Ltd.
C. H. Taylor & Co., Ltd.
Vereinigte Edelstahlwerke

COLLARS - Drill, Large Diameter:

Breda Fucine
G K N Group
Lion Oil Tool
SMFI/Marep
Sea Oil Services, Ltd.
C. H. Taylor & Co., Ltd.

COLLARS - Drill, Spiral Grooved:

Breda Fucine
G K N Group
SMFI/Marep
Sea Oil Services, Ltd.
C. H. Taylor & Co., Ltd.
Vereinigte Edelstahlwerke

COLLARS - Drill, Square:

Breda Fucine
SMFI/Marep
Vereinigte Edelstahlwerke

COLLARS - Float:

Equipetrol S.A.
Sea Oil Services, Ltd.
Site Oil Tool, Ltd.

COLLARS - Formation Pack-Off:

Sea Oil Services, Ltd.

COLLARS - Side Opening:

Sea Oil Services, Ltd.

COLLARS - Stop:

J. Caslake, Ltd.

COLLARS - Substitute:

Lion Oil Tool
SMFI/Marep
Sea Oil Services, Ltd.
C. H. Taylor & Co., Ltd.

COLLARS - Survey, Non-Magnetic:

SMFI/Marep
Sea Oil Services, Ltd.
Vereinigte Edelstahlwerke

COLLARS - Tubing:

Sea Oil Services, Ltd.

COLUMNS - Fractionating:

Creusot-Loire/Pressure Vessels Div.
Motherwell Bridge Group

COMPENSATORS - Crane Load:

Ateliers et Chanteirs De Bretagne
Ceria
Hydraudyne B.V.

COMPENSATORS - Motion, Floating Drilling Vessels:

Ateliers et Chanteirs de Bretagne
GEC Mechanical Handling
Van Der Horst Asia Pte., Ltd.
Wharton Engineers

COMPLETIONS - Sub-Sea:

Ateliers et Chanteirs de Bretagne
Comex Seal
Flopetrol
Seaco
Site Oil Tools, Ltd.

COMPLETIONS - Wireline:

Flopetrol
Seaco

COMPOUNDS - Drawworks:

Industrialexport
Alfred Wirth & Co. KG

COMPRESSORS - Air:

Thomassen
Unitor Ships Service A/S

COMPRESSORS - Air Portable:

Atlas Copco AB
CECA I
Unitor Ships Service A/S

COMPRESSORS - Centrifugal:

Creusot-Loire Compressors
Thomassen
Unitor Ships Service A/S

COMPRESSORS - Gas:

Bharat Heavy Electricals, Ltd.
Creusot-Loire Compressors
Thomassen

COMPRESSORS - Gas Engine:

Creusot-Loire Compressors

COMPRESSORS - Integral:

Creusot-Loire Compressors
Thomassen

COMPRESSORS - Reciprocating:

Creusot-Loire Compressors
Thomassen
Unitor Ships Service A/S

COMPRESSORS - Rotary:

Atlas Copco AB
Thomassen

COMPRESSORS - Turbo:

Thomassen

COMPUTERS - Navigation:

Thomson - CSF AVS

COMPUTERS - Process:

Ferranti, Ltd.

CONDITIONERS - Mud:

CECA I
Hoechst AG
Industrialexport
Norsk Hydro

CONDITIONERS - Water:

CECA I

CONDUIT - Electrical, Coated:

T. I. Group
Uni-Tubes, Ltd.

CONNECTIONS - Clamp Type:

Kurt Kohorn, Ltd.

CONNECTORS - Choke & Kill Line Subsea:

Kurt Kohorn, Ltd.

CONNECTORS - Christman Tree, Subsea:

Creusot-Loire Energie Development
Kurt Kohorn, Ltd.

CONNECTORS - Drill Collar:

Sea Oil Services, Ltd.
C. H. Taylor & Co., Ltd.

CONNECTORS - Electrical:

Klippon Electricals, Ltd.
Societa Cavi Pirelli

CONNECTORS - Electrical, Subsea:

Matra Offshore

CONNECTORS - Electrical, Subsea, Induction Type:

Comex Seal

CONNECTORS - Flowline, Subsea:

Comex Industries
Comex Seal
Paguag GmbH

CONNECTORS - Guideline Remote, Subsea:

Kurt Kohorn, Ltd.

CONNECTORS - Hydraulic, Subsea:

Hydraudyne B.V.
Matra Offshore

CONNECTORS - Mud Line:

Kurt Kohorn, Ltd.

CONNECTORS - Offshore Riser:

Adamson & Hatchett
Comex Industries
Kurt Kohorn, Ltd.

CONNECTORS - Pipe, Flexible:

Paguag GmbH
T. I. Group
Uni-Tubes, Ltd.

CONNECTORS - Riser, Subsea:

Comex Industries
Comex Seal

CONNECTORS - Threaded:

CBV
Equipement Petrolier
Hamblin & Glover Oilfield Services, Ltd.
Klampon Corp.
Kuroda Precision Industries, Ltd.
Niiquta Engineering Company
Vallourec Export
Vitro, S.A.

CONNECTORS - Tubing:

Hamblin & Glover Oilfield Services, Ltd.
Vallourec Export

CONNECTORS - Wellhead, Sub-Sea:

Kurt Kohorn, Ltd.
Thomson-CSF (DASM)

CONSTRUCTION - Offshore:

Creusot-Loire/Pressure Vessels Div.
Elektro Union Offshore A/S
Equipements Macaniques et Hydrauliques
Motherwell Bridge Group
North Sea Exploration Services
Sofresid

CONSULTANTS - Engineering & Planning:

Ateliers et Chanteirs de Bretagne
Comex Industries
Elektro Union Offshore A/S
Novelles Applications Technologiques
Seamore Oil & Gas Processing
Sofresid

CONTRACTORS - Electrical:

Elektro Union Offshore A/S
Holec
North Sea Exploration Services
Northern Rig Lites

CONTROLLERS - Pneumatic:

GEC-Elliott Control Valves, Ltd.
Impamex S.A.

CONTROLS - Acoustic:

BTR Silvertown, Ltd.
Dowty Offshore, Ltd.
Matra Offshore
Thomson-CSF (DASM)

CONTROLS - Automatic Drilling:

Elektro Union Offshore A/S

CONTROLS - Automation:

Brisco Engineering, Ltd.
Elektro Union Offshore A/S
Ferranti, Ltd.

CONTROLS - Automation (contd.)

GEC-Elliott Process Automation, Ltd.
Jeumont-Schneider
Matra Offshore
Rotator Norway A.S.
T. I. Group

CONTROLS - Blowout Preventer, Subsea:

Industrialexport
Matra Offshore
Norsea A/S

CONTROLS - Casing Pressure:

Samega

CONTROLS - Compressor:

Elektro Union Offshore A/S

CONTROLS - Digital:

Dowty Offshore, Ltd.
GEC-Elliott Process Automation, Ltd.
Matra Offshore

CONTROLS - Down Hole Blowout Preventer:

Matra Offshore

CONTROLS - Drawworks Feed:

Holec

CONTROLS - Electric Motor:

Brissonneau & Lotz Marine
Elektro Union Offshore A/S
Holec
Jeumont-Schneider
Sigmund Pulsometer Pumps
T. I. Group

CONTROLS - Engine Safety:

Barber Industries, Ltd.
Dowty Offshore, Ltd.
Sigmund Pulsometer Pumps

CONTROLS - Flow, Subsea:

Matra Offshore

CONTROLS - Gas:

GEC-Elliott Control Valves, Ltd.
P. D. Rasspe Sohne
Samega

CONTROLS - Hydraulic:

Automotive Products, Ltd.
Brissonneau & Lotz Marine
Bronzavia
Ceria
Dowty Offshore, Ltd.
Matra Offshore
Rotator Norway
Sigmund Pulsometer Pumps

CONTROLS - Hydraulic Pumping:

Dowty Offshore, Ltd.
Hydraudyne B.V.
Jeumont-Schneider

CONTROLS - Liquid Level:

Barber Industries, Ltd.
GEC-Elliott Control Valves, Ltd.
Samega

CONTROLS - Manifold, Valves:

Lanzagorta/PIP
Matra Offshore

CONTROLS - Pressure:

GEC-Elliott Control Valves, Ltd.
T. I. Group

CONTROLS - Process Equipment:

GEC-Elliott Process Automation, Ltd.
T. I. Group

CONTROLS - Pump:

Bronzavia
C G A/Alcatel
Samega
Sigmund Pulsometer Pumps

CONTROLS - Pumping, Hydraulic:

Ceria B
Dowty Offshore, Ltd.

**CONTROLS** - Temperature:

Samega
T. I. Group

**CONTROLS** - Vibration:

Dowty Offshore, Ltd.

**CONTROLS** - Water Quality:

Unitor Ships Service AS

**CONTROLS** - Weight:

Flopetrol
Samega

**CONTROLS** - Wellhead, Subsea:

Comex Seal
Matra Offshore

**CONTROLS** - Well Production Test:

Flopetrol
Matra Offshore

**CONVERTERS** - Torque:

Industrialexport

**CONVEYORS** - Bulk Material:

Industrialexport

**CORDAGE** - Manila, Sisal Jute & Synthetic:

Elkem-Spigerverket A/S
Hawkins & Tipson Ropemarkers
Hendrik Veder
United Ropeworks

**CORING** - Equipment Rental:

Diamant Boart S. A.

**CORING** - Service:

Diamant Boart S. A.
J. K. Smit & Sons

**CORING** - Subsea:

Geomecanique

**CORING** - Wireline:

Diamant Boart S.A.
United Ropeworks

**COUNTERS** - Pump Stroke:

Samega

**COUNTERS** - Rotary Table:

Samega

**COUPLINGS** - Casing:

British Steel Corp.
Dalmine
Hamblin & Glover Oilfield Services, Ltd.
Kuroda Precision Industries, Ltd.
Mannesmannrohren-Werke
Nippon Kokan
Sea Oil Services, Ltd.
Vallourec Export

**COUPLINGS** - Disconnect:

GEC Mechanical Handling
Gummi A/S K. Lund & Company

**COUPLINGS** - Drive Pipe:

Dalmine
Kurt Kohorn, Ltd.

**COUPLINGS** - Flow:

Breda Fucine
Dalmine

**COUPLINGS** - Fluid:

Industrialexportimport
Renold Power Transmission, Ltd.
Voith Getreibe

**COUPLINGS** - Geared:

Engrenages Et Reducteurs/Citroen-Messian
Rademakers
Voith Getreibe

**COUPLINGS** - Hose:

Arbarthorpe Oilfield Services, Ltd.
Atlas Copco AB
GEC Mechanical Handling
Gummi A/S K. Lund & Co.
Industrialexportimport

COUPLINGS - Hose (contd.)

Mento A/S
Paguag GmbH
T. I. Group
Unitor Ships Service AS

COUPLINGS - Hydraulic:

Gummi A/S K. Lund & Co.
Hi-Flex International, Ltd.
Hydraudyne B.V.
Unitor Ships Service AS
Voith Getriebe

COUPLINGS - Pipe:

British Steel Corp.
Hamblin & Glover Oilfield Services, Ltd.
Hydraudyne B.V.
Kawasaki Steel Corp.
Kurt Kohorn, Ltd.
Mannesmanrohren-Werke
Nippon Kokan
Paguag GmbH
Sandvik AB
Sea Oil Services, Ltd.
Sigma Chemie, Ltd.
T. I. Group
Unitor Ships Service AS
Vallourec Export

COUPLINGS - Polished Rod:

Ceria B
Industrialexportimport
Vereinigte Edelstahlwerke AG

COUPLINGS, PUP JOINTS, CONNECTORS:

Arai Iron Works Co., Ltd.
Awaji Sangyo K.K.
Canvil, Ltd.
Fukuda Kogyo Co., Ltd.
Hamblin Oilfield Services, Ltd.
Kashiwara Machine Mfg. Co., Ltd.
Kimura Yasaku Co., Ltd.
Kobayashigen Sangyo Co., Ltd.
Metalurgica Bellucci S.A.I.C.F.I.A.
Nippon KokanTsugite Kabushiki Kaisha
Oilfield Mfg. Pte., Ltd.
Oilfield Tubular Services Pte., Ltd.
R & D Machine, Ltd.
Reinhold Industries, Ltd.
Tamotsu Kogyo Kabushiki Kaisha
Tokiwa Industrial Co., Ltd.
Tokyo Kinzoku Kogyo K.K.

COUPLINGS, PUP JOINTS, CONNECTORS (contd.)

Toshin Kogyo Co., Ltd.
T. P. S. Industries, Ltd.
Tsujikawa Mfg. Co., Ltd.

COUPLINGS - Quick Disconnect:

GEC Machanical Handling
Gummi A/S K. Lund & Co.
Kurt Kohorn, Ltd.

COUPLINGS - Riser, Subsea:

Kurt Kohorn, Ltd.

COUPLINGS - Sucker Rod:

Ceria B
Dalmine
Drillcon Industries, Ltd.
Industrialexportimport
Kuroda Precision Industries, Ltd.
Sigma Chemie, Ltd.
Vereinigte Edelstahlwerke AG

COUPLINGS - Tubing:

British Steel Corp.
Drillcon Industries, Ltd.
Hamblin & Glover Oilfield Services, Ltd.
Kawasaki Steel Corp.
Kuroda Precision Industries, Ltd.
Mannesmannrohren-Werke
Nippon Kokan
Phoceenne De Metallurgie
Sandvik AB
Sigma Chemie, Ltd.
T. I. Group
Vallourec Export

COVERS - Hydraulic Cylinder:

Hydraudyne B.V.
Wirth Maschinen-Und-Bohrgerate-Fabrick

CRANES:

A/S Moelven Brug
Ceria
Clarke Chapman, Ltd.
Hydraulik Brattvaag
A. S. Norman
Nylands Verksted
Oil Industry Services AS
Olympic Ironworks, Ltd.
Phoceenne De Metallurgie

CRANES - Amphibious:

Ceria
Wharton Engineers

CRANES - Bridge:

Olympic Ironworks, Ltd.

CRANES - Deck:

A/S Moelven Brug
Brissonneau & Lotz Marine
Ceria
Clarke Chapman, Ltd.
Hydraulik Brattvaag
Skagit Corp.

CRANES - Derrick:

Clarke Chapman, Ltd.
A. S. Normar
Wharton Engineers

CRANES - Gantry:

A/S Moelven Brug
Ceria
Ethyd
A. S. Normar
Wharton Engineers

CRANES - Jib:

A/S Moelven Brug
Clarke Chapman, Ltd.
Hydraulik Brattvaag
Industrialexportimport
A. S. Normar
Verhoef Aluminum Scheepsbouwindustrie
Wharton Engineers

CRANES - Platform:

Goes International Petroleum Services
Pte., Ltd.

CROSSES - Flow:

Lanzagorta/PIP

CROSSES - Mud:

Breda Fucine
Offshore Drilling Supplies, Ltd.

CUPS - Hydraulic:

Lubrikup Co., Inc.

CUPS - Packer:

Industrialexportimport

CUPS - Pump Piston:

Sigma Chemie, Ltd.

CUPS - Seating:

Regal Industrial Rubber CA
S.B.S.
S.K.A.
Vereinigte Edelstahlwerke

CUPS - Swab:

Goes International Petroleum Services Pte., Ltd.
Phoceenne De Metallurgie
Regal Industrial Rubber CA
S,K,A,
Stabylia

CUPS - Valve:

Regal Industrial Rubber CA
S.B.S.
Vereinigt Edelstahlwerke

CUTTERS - Big Hole Bit:

Sea Oil Services, Ltd.

CUTTERS - Bottom Hole Jet:

Tesel Services, Ltd.

CUTTERS - Casing, Tubing & Drill Pipe:

Industrialexportimport
Kuroda Precision Industries, Ltd.
Offshore Drilling Supplies, Limited
Tesel Services, Ltd.

CUTTERS - Hydraulic, Underwater:

Hydraudyne B.V.

CUTTERS - Measuring Line:

Flopetrol

CUTTERS - Multi-String:

Tesel Services, Ltd.

CUTTERS - Pipe:

Tesel Services, Ltd.

**CUTTERS** - Wire Rope & Cable:

Flopetrol
Industrialexportimport
Unitor Ships Service AS

**CYCLONES**:

Industrialexport
Sigma Chemie, Ltd.
Thule United, Ltd.

**CYLINDERS** - Air:

France Operator
Hydraudyne B.V.
Pronal
P. D. Rasspe Sohne
Unitor Ships Service AS

**CYLINDERS** - Hydraulic:

Automotive Products, Ltd.
Dowty Offshore, Ltd.
Ethyd
France Operator
G K N Group
Hydraudyne B.V.
Kurt Kohorn, Ltd.
P. D. Rasspe Sohne
Rotator Norway
Sandvik AB
Saut Du Tarn
Van Der Horst Asia Pte., Ltd.
Alfred Wirth & Co., KG

**DAMPENERS** - Pulsation:

Goes International Petroleum Service Pte., Ltd.
Offshore Drilling Supplies, Ltd.
Wirth Maschinen-Und Bohrgerate-Fabrick
Alfred Wirth & Co. KG

**DAMPERS** - Vibration, Shock:

BTR Silvertown, Ltd.
Dowty Offshore, Ltd.
Hydraudyne B.V.
Sigma Chemie, Ltd.

**DECK MACHINERY** - Marine Drillship and Workboat:

A. S. Bergens Mekaniske Verk
Brissonneau & Lotz Marine

**DECK MACHINERY** - Marine Drillship and Workboat (contd.)

Ceria
Clarke Chapman, Ltd.
Hydraulik Brattvaag
Wharton Engineers

**DECKS** - Landing:

A/S Raufoss
New-Mar Oil Services, Ltd.
Norseman Shelters, Ltd.
Oil Industry Services AS
Sigma Chemie, Ltd.

**DAVITS** - Single Fall, Survival Systems:

Ceria
Wharton Engineers

**DECKING** - Steel:

Redpath Dorman Long
T. I. Group

**DE-FOAMERS**:

Anchor Drilling Fluids A/S
CECA S.A.

**DE-GASSERS** - Mud:

Dreco, Ltd.
Industrialexport
Itag
Samega

**DE-GASSERS** - Sea Water:

Offshore Drilling Supplies, Ltd.
Serck Baker

**DEHYDRATORS** - Crude Oil:

Golden Olfeddausrustungen
Robert Jenkins Oil & Gas, Ltd.

**DEHYDRATORS** - Gas:

Creusot-Loire Pressure Vessels Div.
C. Goldhan
Golden Olfeddausrustungen
Robert Jenkins Oil & Gas
Porta-Test Mfg., Ltd.
Siirtec

DENSIMETERS:

C G A/Alcatel
Samega

DEPTHOMETERS:

Flopetrol
Friedrich Leutert GmbH & Co.
Kingston Instrument Co., Ltd.
Samega
Tesel Services, Ltd.

DERRICKS:

De Vries Robbe & Co., N.V.
Nuovo Pigone, S.p.A.
Oil Well Engineering Co., Ltd
Waagner-Biro Aktiengesellschaft

DERRICKS - Dynamic:

Olympic Ironworks, Ltd.
Joseph Paris SA
Silvio Ballerini & C

DERRICKS - Floating:

Dreco, Ltd.
Olympic Ironworks, Ltd.
Joseph Paris SA

DERRICKS - Multiple Well:

Dreco, Ltd.
Industrialexport
Massarenti
Olympic Ironworks, Ltd.

DERRICKS - Portable:

Dreco, Ltd.
Industrialexport
Lansagorta/CM

DERRICKS - Servicing:

Dreco, Ltd.
Industrialexport
Lansagorta/CM
Massarenti
Olympic Ironworks Ltd.
Joseph Paris

DERRICKS - Stiffleg:

Lansagorta/CM
Olympic Ironworks, Ltd.
Joseph Paris SA

DERRICKS - Telescoping:

Dreco, Ltd.
Lansagorta/CM
Massarenti
Olympic Ironworks, Ltd.
Salzgitter Maschinen

DERRICKS - Tripod:

Joseph Paris SA

DESALTERS - Crude Oil:

Offshore Drilling Supplies, Ltd.

DESALTERS - Seawater:

Robert Jenkins Oil & Gas, Ltd.

DESANDERS - Mud:

Dreco, Ltd.
Industrialexport
Offshore Drilling Supplies, Ltd.
Sigma Chemie, Ltd.
Silvio Ballerini & C

DE-SCALERS:

Offshore Drilling Supplies, Ltd.

DE-SILTERS - Mud:

Dreco, Ltd.
Industrialexport
Offshore Drilling Supplies, Ltd.
Sigma Chemie, Ltd.
Thule United, Ltd.

DESURGERS - Pump:

Sigma Chemie, Ltd.

DESULFURIZERS:

Creusot-Loire/Pressure Vessels Div.

DETECTORS - Gas

Samega

DETECTORS - Hydrogen Sulfide:

Samega

DETECTORS - Loss Circulation:

Samega

**DEVICES** - Wire Line Measuring:

Ceria
Flopetrol
Western Hydraulic

**DIES** - Tong:

Arbarthorpe Oilfield Services, Ltd.
Offshore Drilling Supplies Limited
Vereinigte Edelstahlwerke

**DIGITISERS**:

Ferranti, Ltd.
Tesel Services, Ltd.

**DIRECTORS** - Gas:

C G A/Alcatel

**DIVERTERS** - B.O.P. Subsea:

Offshore Drilling, Ltd.

**DOGS** - Slip:

Vereinigte Edelstahlwerke

**DOLLIES** - Pipe:

Arbarthorpe Oilfield Services, Ltd.

**DRAUGHTING** - Equipment:

Ferranti, Ltd.

**DRAWWORKS**:

Bharat Heavy Electricals, Ltd.
Dreco, Ltd.
Industria Del Hierro, S.A. De C.V.
Industrialexport
Lanzagorta/CM
Massaranti
Offshore Drilling Supplies, Ltd.
Salzgitter Maschinen
Unitor Ships Service AG
Wharton Engineers
Alfred Wirth Co. KG
Wirth Maschinen-Und Bohrgerate-Fabrick

**DRILLING** - Air, Gas:

Industrialexportimport
Salzgitter Maschinen

**DRILLING** - Directional:

Alsthom-Atlantique, Neyrfor
Industrialexportimport

**DRILLING** - Reverse Circulation:

Industrialexport
Massarenti
Salzgitter Maschinen

**DRILLING RIGS** - Cable Tool:

Coventry Gauge, Ltd.
Steward Ross & Company, Ltd.
Stow Engineering Company Ltd.
Tru-Thread, Ltd.

**DRILLS** - Air:

Atlas Copco AB
Unitor Ships Service

**DRILLS** - Core:

Diamant Boart S.A.
J. K. Smit & Sons

**DRILLS** - Mud Motor:

Drilex (Aberdeen), Ltd.

**DRILLS** - Turbo:

Alsthom - Atlantique, Neyrfor
Drilex (Aberdeen), Ltd.
Vereinigte Edelstahlwerke

**DRIVES** - Chain:

Amsted-Siemag Kette
Olympic Ironworks, Ltd.
Renold, Ltd.
Renold Power Transmission, Ltd.
Sedis

**DRIVES** - Compound:

Industrialexport
Massarenti
Olympic Ironworks, Ltd.
Petbow, Ltd.
Alfred Wirth & Co. KG
Wirth Maschinen-Und Bahgerate-Fabrick

DRIVES - Compressor:

GEC Gas Turbines Limited
Jeumont-Schneider
Thomassen

DRIVES - Gear:

CIT Alcatel (Gears)
Engrenages Et Reducteurs/Citroen-Messian
Rademakers
Renold, Ltd.
Salzgitter Maschinen

DRIVES - Hydraulic:

A. S. Bergens Mekaniske Verk
Brissonneau & Lotz Marine
Dowty Offshore, Ltd.
Hydraudyne B.V.

DRIVES - Mud Pump:

Industrialexport
Jeumont-Schneider
Massarenti
Vereinigte Edelstahlwerke AG

DRIVES - Pump:

GEC Gas Turbines Limited
Industrialexport
Jeumont-Schneider
Thomassen

DRIVES - Rotary Rig:

Industrialexport

DRIVES - Rotary Tables:

Industrialexport
Salzgitter Maschinen
Vereinigte Edelstahlwerke AG
Alfred Wirth & Co. AG
Wirth Maschinen-Und Bohrgerate-Fabrik

DRYERS - Air:

Atlas Copco AB

DUMPS - Cement:

Tesel Services, Ltd.

DYNAMOMETERS:

Friedrich Leutert GmbH & Co.

ELECTRODES:

G K N Group
Klippon Electricals, Ltd.
Sandvik AB
Unitor Ships Service

ELEVATORS - Casing:

Arbarthorpe Oilfield Services, Ltd.
Griffith Oil Tool, Ltd.
Industrialexport
Offshore Drilling Supplies Limited
Tsukamoto Seiki Co.
Vereinigte Edelstahlwerke

ELEVATORS - Drawworks:

Dreco, Ltd.
Massarenti

ELEVATORS - Drill Collar:

Blohn & Voss AG
Industrialexport
Offshore Drilling Supplies Limited
Tsukamoto Seiki Co.
Vereinigte Edelstahlwerke

ELEVATORS - Drill Pipe:

Silvio Ballerini & C
Blohn & Voss AG
Industrialexport
Offshore Drilling Supplies Limited
Tsukamoto Seiki Co.
Vereinigte Edelstahlwerke

ELEVATORS - Multiple Tubings:

Solum Oil Tool

ELEVATORS - Pipe:

Blohm & Voss AG
Industrialexport
Tsukamoto Seiki Co.

ELEVATORS - Rig:

Brissonneau & Lotz Marine

### ELEVATORS - Rig, Personnel & Equipment:

Ceria
Non Corrosive Metal Products, Ltd.

### ELEVATORS - Sucker Rod:

Ceria B
Industrialexport

### ELEVATORS - Tubing:

Blohm & Voss AG
Griffith Oil Tool, Ltd.
Industrialexport
Offshore Drilling Supplies, Ltd.
Sea Oil Services, Ltd.
Vereinigte Edelstahlwerke

### EMULSIFIERS:

CECA I
Chemische Fabriek Servo BV

### ENCLOSURES - Instrument:

Klippon Electricals, Ltd.

### ENDS - Fluid:

Mento A/S
Offshore Drilling Supplies, Ltd.
Oil Industry Services AS

### ENGINEERING:

CIT Alcatel (Gears)
Comex Seal
Elektro Union Offshore A/S
GEC Machanical Handling
Novelles Applications Technologiques
Seamore Oil & Gas Processing
Sofresid

### ENGINEERING - Offshore:

Dowty Offshore, Ltd.
Elektro Union Offshore A/S
Ethyd
G K N Group
Redpath Dorman Long
Sofresid
Wharton Engineers

### ENGINEERING - Systems Control:

Dowty Offshore, Ltd.
Elektro Union Offshore A/S
GEC-Elliott Process Automation Limited
Matra Offshore
Sofresid

### ENGINEERING - Water Service:

G K N Group

### ENGINES - Air Cooled:

Klockner-Humboldt-Deutz

### ENGINES - Diesel or Oil:

Alsthom Atlantique/Moteurs
A. S. Bergens Mekaniske Verk
Bofors/Nohab
Industrialexport
Irgens Larsen A/S
Klockner-Humboldt-Deutz
Nippon Kokan K.K.
Paxman Diesels
Rognon S.A.
Ruston Diesels
S A C M
Bertel O. Steen A/S

### ENGINES - Gas:

Ceria B
Ruston Gas Turbines
S A C M
Thomassen

### ENGINES - Marine:

Alsthom-Atlantique Diesel
Bofors/Nohab
Paxman Diesels
Ruston Diesels
S A C M
Bertel O. Steen A/S

### ENGINES - Pumping:

Ceria B
Paxman Diesels
Ruston Diesels
Ruston Gas Turbines
S A C M
Bertel O. Steen A/S

ENGINES - Truck:

Klockner-Humboldt-Deutz AG

ENGINES - Turbo-Charged:

Alsthom-Atlantique Diesel
CIT Alcatel (Gears)
Industrialexport
Paxman Diesels
Ruston Diesels
S A C M
Bertel O. Steen A/S
Thomassen

EQUIPMENT - Battery Charging:

Northern Rig Lites
Thomson - CSF AVS

EQUIPMENT - Bulk Material Handling:

CECA I
Ethyd
Olympic Ironworks, Ltd.
Rotator Norway
Wharton Engineers

EQUIPMENT - Combination, Lease Heating:

C. Goldhan
Industrialexportimport
Porta-Test Systems, Ltd.

EQUIPMENT - Communication:

Elektro Union Offshore A/S
GEC Electrical Projects Limited
GEC-Elliott Process Automation, Ltd.

EQUIPMENT - Communications, Subsea:

Comex Industries
Dowty Offshore, Ltd.
Industrialexportimport
Thomson CSF (D A S M)

EQUIPMENT - Core Testing:

Christensen Diamond Product Co.
Diamant Boart S. A.
Geomecanique
R O P
Samega

EQUIPMENT - Cutting & Welding:

Brisco Engineering, Ltd.
J. Caslake, Ltd.
G K N Group
Sandvik AB
Unitor Ships Service AS

EQUIPMENT - Diving:

CIT Alcatel
Ceria
Comex Industries
Comex Seal
Lockheed Petroleum Services, Ltd.
Unitor Ship Services

EQUIPMENT - Electrical:

Bharat Heavy Electricals, Ltd.
Dowty Offshore, Ltd.
Elektro Union Offshore A/S
GEC Electrical Projects Limited
GEC Machines
Jeumont-Schneider
Klippon Electricals, Ltd.
Norsea A/S
Northern Rig Lites
Oil Industry Services AS
Rognon S.A.
Societa Cavi Pirelli
T. I. Group

EQUIPMENT - Fire Fighting:

Irgens Larsen A/S
Non Corrosive Metal Products, Ltd.
Sigmund Pulsometer Pumps, Ltd.
Bertel O. Steen A/S
Thune-Eureka A/S
Unitor Ships Service AS

EQUIPMENT - Hose Fitting Installation:

Arbarthorpe Oilfield Services, Ltd.
Gummi A/S K. Lund & Co.
Industrialexportimport
Offshore Drilling Supplies, Ltd.

EQUIPMENT - Laboratory:

Anchor Drilling Fluids A/S
Basset-Bretagne-Loire
CECA SA
Flopetrol
Geomecanique
R O P
Samega

EQUIPMENT - Mud Testing:

Anchor Drilling Fluids A/S
Kingston Instrument Co., Ltd.

EQUIPMENT -Noise Control:

GEC-Elliott Control Valves, Ltd.
Norseman Shelters, Ltd.

EQUIPMENT - Painting:

Atlas Copco AB
Unitor Ship Services AS

EQUIPMENT - Pipe Inspection:

Breda Fucine

EQUIPMENT - Pollution Control:

Arbarthorpe Oilfield Services, Ltd.
G K N Group
Nippon Kokan K.K.
Novelles Applications Technologiques
Porta-Test Systems, Ltd.
Serck Baker
Sofrance
Thomson - CSF AVS
Unitor Ships Service AS

EQUIPMENT - Production, Packaged:

Brisco Engineering, Ltd.
C. Goldhan
Goldhan Olfeddausrustungen
Intermare Sarda
Robert Jenkins Oil & Gas, Ltd.
Lockheed Petroleum Services, Ltd.
Porta-Test Systems, Ltd.
Seamore Oil & Gas Processing
Siirtec

EQUIPMENT - Safety:

Barber Industries, Ltd.
Brisco Engineering, Ltd.
CIT Alcatel
Hawkins & Tipson Ropemakers
Mento A/S
Oil Industry Services AS
Rognon SA
Unitor Ships Service AS

EQUIPMENT - Steam Flooding:

G K N Group
Offshore Drilling Supplies, Ltd.
Porta-Test Systems, Ltd.
Serck Baker
Venezuela Oil Tool

EQUIPMENT - Water Flooding:
G K N Group
Porta-Test Systems, Ltd.
S.K.A.
Serck Baker
Venezuela Oil Tool
EQUIPMENT - Water Treating:

G K N Group
Nippon Kokan K.K.
Pall Trinity Micro Corp.
Phoceenne De Metallurgie
Serck Baker

EQUIPMENT - Well Logging:

Sumega
Tesel Services, Ltd.

ESCALATORS - Rig, Personnel & Equipment:

Non Corrosive Products, Ltd.

EVALUATION - Formation:

Basset-Bretagne-Loire

EVAPORATORS - Heat Recovery:

Novelles Applications Technologiques

EXCHANGERS - Heat:

G K N Group
C. Goldhan
Motherwell Bridge Group
Nippon Kokan K.K.
Novelles Applications Technologiques

EXPORTS - Assembly & Rig-Up:

Non Corrosive Products Ltd.

FABRICATION:

Adamson & Hatchett
Arbarthorpe Oilfield Services, Ltd.
Ateliers et Chanteirs de Bretagne
Barber Industries, Ltd.
Bharat Heavy Electricals, Ltd.
Creusot-Loire/Pressure Vessels Div.
Massarenti
Motherwell Bridge Group
Norseman Shelters, Ltd.
North Sea Exploration Services

FABRICATION - (contd.)

Oil Industry Services AS
Redpath Dorman Long
Sea Oil Services, Ltd.

FACINGS - Clutch:

T. I. Group

FAIRLEADS:

A. S. Bergens Mekaniske Verk
Ceria
Clarke Chapman, Ltd.

FENDERS - Dock:

BTR Silvertown, Ltd.
Hendrik Veder

FILTERS - Air:

G K N Group
Mento A/S
Plenty Group, Ltd.

FILTERS - Chemical:

Plenty Group, Ltd.

FILTERS - Fuel:

New-Mar Oil Services, Ltd.
Plenty Group, Ltd.
Saut-Du-Tarn
Sofrance

FILTERS - Hydrocyclone:

Sigma Chemie, Ltd.

FILTERS - Oil:

G K N Group
Hydraudyne B.V.
Phoceenne De Metallurgie
Plenty Group, Ltd.
Saut-Du-Tarn
Sofrance

FILTERS - Pipeline:

Plenty Group, Ltd.
Porta-Test Systems, Ltd.

FILTERS - Sand:

G K N Group
Plenty Group, Ltd.
Sigma Chemie, Ltd.

FILTERS - Water:

New-Mar Oil Services, Ltd.
Plenty Group, Ltd.
Saut-Du-Tarn

FISHING - Services:

Offshore Drilling Supplies, Ltd.
Tesel Services, Ltd.

FITTINGS - Access, High Pressure:

Gummi A/S K. Jund & Co.
Hydraudyne B.V.
Industrialexport
Vallourec Export

FITTINGS - Cable:

Bruce International

FITTINGS - Cast Steel:

Phoceenne De Metallurgie
Trouvay & Cauvin

FITTINGS - Chain:

Sedis

FITTINGS - Electrical:

Dowty Offshore, Ltd.
Elektro Union Offshore A/S
Goes International Petroleum Services Pte., Ltd.
Northern Rig Lites
Societa Cavi Pirelli
T. I. Group

FITTINGS - Electrical Coated:

Northern Rig Lites

FITTINGS - Fiberglass Epoxy:

Trouvay & Cauvin

FITTINGS - Forged Steel:

Lanzagorta/FIP
Phoceenne De Metallurgie
Silvio Ballerini & C
T. I. Group
Trouvay & Cauvin

FITTINGS - High Pressure:

G K N Group
Hi-Flex International, Ltd.
Hydraudyne B.V.
Industrialexport
Lanzagorta/FIP
Offshore Drilling Supplies, Ltd.
Phoceenne De Metallurgie
Trouvay & Cauvin
Vallourec Export

FITTINGS - Hose:

Arbarthorpe Oilfield Services, Ltd.
Griflex Products, Ltd.
Gummi A/S K. Lund & Co.
Hi-Flex International, Ltd.
Industrialexport
Phoceenne De Metallurgie
T. I. Group

FITTINGS - Mud Line:

Industrialexport

FITTINGS - Orifice:

Phoceenne De Metallurgie

FITTINGS - Pipe:

John Brereton & Company, Ltd.
G K N Group
Goes International Petroleum Services Pte., Ltd.
Hoesch Roehrenwerke
Industrialexport
Nippon Kokan K.K.
Offshore Drilling Supplies, Ltd.
Phoceenne De Metallurgie
Sandvik AB
Sumitomo Metal Industries, Ltd.
T. I. Group
Trouvay & Cauvin
Vallourec Export

FITTINGS - Tube:

John Brereton & Company, Ltd.
Brisco Engineering, Ltd.
Nippon Kokan K.K.
Phoceenne De Metallurgie
Sandvik AB
Trouvay & Cauvin

FITTINGS - Welding:

G K N Group
Phoceenne De Metallurgie
Sandvik AB
T. I. Group
Trouvay & Cauvin
Vallourec Export

FITTINGS - Wire Rope:

Ansell, Jones & Co., Ltd.
G K N Group
Hawkins & Tipson Ropemakers
Sea Oil Services, Ltd.
United Ropeworks
Hendrik Veder

FLANGES - Annulus:

John Brereton & Company, Ltd.
T. I. Group
Trouvay & Cauvin

FLANGES - Blind:

John Brereton & Company, Ltd.
Canada
Lanzagorta/FIP
Phoceenne De Metallurgie
Sandvik AB
T. I. Group

FLANGES - Companion:

John Bererton & Company, Ltd.
Canada
Lanzagorta/FIP
Phoceenne De Metallurgie
Sandvik AB
T. I. Group
Trouvay & Cauvin

FLANGES - Drilling:

Industrialexportimport

**FLANGES** - Dual String:

John Brereton & Company, Ltd.
Lanzagorta/FIP

**FLANGES** - Orifice:

John Brereton & Company, Ltd.
Phoceenne De Metallurgie
T. I. Group
Trouvay & Cauvin

**FLANGES** - Repair:

Phoceenne De Metallurgie

**FLANGES** - Welding:

John Brereton & Company, Ltd.
Canada
Canada Works
Goes International Petroleum Services
  Pte., Ltd.
Lanzagorta/FIP
Phoceenne De Metallurgie
Sandvik AB
Trouvay & Cauvin

**FLARES** - Gas:

Barber Industries, Ltd.
G K N Group
Oil Industry Services AS

**FLOATS** - Drill Pipe:

Equipetrol S.A.
Offshore Drilling Supplies, Ltd.

**FLOATS** - Life:

Unitor Ships Service AS

**FLUIDS** - Casing Pack:

CECA I
CECA S.A.
Servecio Hydrocarb

**FLUIDS** - Completion:

CECA I
Hoechst AG
Servecio Hydrocarb

**FLUIDS** - Hydraulic Control:

Bronzavia
Dowty Offshore, Ltd.
Hydraudyne B.V.
Ultraglide Limited

**FLUIDS** - Packer:

Anchor Drilling Fluids A/S
CECA I
Servecio Hydrocarb

**FLUIDS** - Workover:

Anchor Drilling Fluids A/S
CECA S.A.

**FOOTWEAR** - Safety Shoes & Boots

Arbarthorpe Oilfield Services, Ltd.
Hevea Raalte B.V.
Unitor Ships Service SA

**FORGINGS**:

Breda Fucine
Creusot-Loire Energie Developments

**FORGINGS** - Valve:

Breda Fucine
Brisco Engineering, Ltd.
Lanzagorta?FIP
Phoceenne De Metallurgie

**FORMS** - Sulphur:

Barber Industries, Ltd.

**GAGES**:

Coventry Gauge, Ltd.
Creusot-Loire
Dai-Ichi Sokuhan Works, Ltd.
Dalmine S.p.A.
Horstmann Gauge & Metrology, Ltd.
Kuroda Precision Industries, Ltd.
Mannesmannroehren-Werke A.G.
OSG Manufacturing Company
Tru-Thread, Ltd.
Tokyo Sokuhan Co., Ltd.

**GAGES** - Bottom Hole Pressure:

Flopetrol
Friedrich Leutert GmbH & Co.
Lanzagorta/FMCA

**GAGES** - Casing:

Kuroda Precision Industries, Ltd.
SMFI/Creusot-Loire
T. I. Group

GAGES - Dead Weight:

Friedrich Leutert GmbH & Co.

GAGES - Density:

Samega

GAGES - Depth:

Samega

GAGES - Differential Pressure:

Friedrich Leutert GmbH & Co.
Lanzagorta/FMCA

GAGES - Flow:

Lanzagorta/FMCA

GAGES - Liquid Level:

C. Goldhan
Samega

GAGES - Mud Pump:

Lanzagorta International, Inc.
Offshore Drilling Supplies, Ltd.
Samega

GAGES - Pressure:

Brisco Engineering, Ltd.
Flopetrol
Friedrich Leutert GmbH & Co.
Lanzagorta/FMCA
Samega

GAGES - R.P.M.:

Rognon S.A.
Samega

GAGES - Thread Inspection:

Kuroda Precision Industries, Ltd.
T. I. Group

GAGES - Tubing, Internal:

Kuroda Precision Industries, Ltd.
T. I. Group

GASKETS - Asbestos:

T. I. Group

GASKETS - Blowout Preventer:

Offshore Drilling Supplies Limited

GASKETS - Fiber:

Phoceenne De Metallurgie
T. I. Group

GASKETS - Metallic:

T. I. Group

GASKETS - Moulded:

Dowty Offshore, Ltd.
Stabylica

GASKETS - Ring:

Canada Works
Dowty Offshore, Ltd.
Lanzagorta/FIP
Phoceenne De Metallurgie
Sigma Chemie, Ltd.
T. I. Group

GASKETS - Rubber:

Breda Fucine
Dowty Offshore, Ltd.
Hallite, Ltd.
Sigma Chemie, Ltd.
Stabylia
T. I. Group

GASKETS - Steel:

Lanzagorta/FIP

GEAR UNITS - Variable Speed:

Rademakers
Renold, Ltd.
Voith Getriebe

GEARS:

CIT Alcatel (Gears)
Jensen Brothers Mfg. Co., Inc.
Rademakers
Renold, Ltd.
Salzgitter

GEARS (contd.)

Sumitomo Metal Industries, Ltd.
Voith Getriebe

GEARS - Marine:

Engrenages Et Reducteurs/Citroen-Messian
Rademakers

GEARS - Speed Increasing:

CIT Alcatel (Gears)
Engrenages Et Reducteurs/Citroen-Messian
Rademakers
GEARS - Worm:

CIT Alcatel (Gears)
Engrenages Et Reducteurs/Citroen-Messian
Renold, Ltd.

GENERATORS - Electric:

A. S. Bergens Mekaniske Verk
Bharat Heavy Electricals, Ltd.
GBC Machines
Holec
Industrialexport
Jeumont-Schneider
Klockner-Humboldt-Deutz
Northern Rig Lites
Paxman Diesels
Petbow, Ltd.
Rognon S.A.
Bertel O. Steen A/S

GENERATORS - Electric, Solar:

Industrialexport

GENERATORS - Steam:

Bharat Heavy Electricals, Ltd.

GLOVES - Safety:

Unitor Ships Service SA

GOGGLES - Divins:

Unitor Ships Service

GRABS - Rope, Wire Line:

Hendrik Veder

GRAVEL - Sand Control:

Sea Oil Services, Ltd.
Servecio Hydrocarb
GREASE & OILS:

Sigma Chemie, Ltd.
Ultraglide Limited

GRINDERS:

Unitor Ships Service SA

GRIPS - Catline:

Dreco, Ltd.

GROUTING - Packers:

Sigma Chemie, Ltd.

GUARDS - Kelly Bushing:

Arbarthorpe Oilfield Services, Ltd.

GUARDS - Pumping Unit, Crank:

Ceria B
Salzgitter

GUIDES - Completion:

Equipetrol S.A.

GUIDES - Milling:

Industrialexportimport

GUIDES - Overshot:

Industrialexportimport
Offshore Drilling Supplies, Ltd.

GUIDES - Sucker Rod:

Industrialexportimport
Vereinigte Edelstahlwerke AG

GUIDES - Wireline:

Ceria
Hendrik Veder
Offshore Drilling Supplies, Ltd.
Stabylia

GUNS - Mud:

Industrialexport
Kingston Instrument Co., Ltd.

GYROS - Directional:

Ferranti, Ltd.
Friedrich Leutert GmbH

HANGERS - Casing:

Breda Fucine
Canada
Industrialexportimport
Lanzagorta/FIP
Venezuela Oil Tool

HANGERS - Tubing:

Breda Fucine
Canada
Industrialexport
Lanzagorta/FIP
T. I. Group
Venezuela Oil Tool

HANGERS - Tubing, Multiple String:

Breda Fucine
Canada
Lanzagorta/FIP
Venezuela Oil Tool

HANGERS - Wireline Guide:

Hendrik Veder

HARDBANDING - Service:

Lion Oil Tool

HARDFACING:

Breda Fucine
Drillcon Industries, Ltd.
Equipetrol S.A.
G K N Group
Lion Oil Tool
SMFI/Marep
T. P. DeMexico S.A.
Vereinigte Edelstahlwerke AG

HEADS - Casing:

Breda Fucine
Canada
Goes International Petroleum Service Pte., Ltd.
Industrialexport

HEADS - Casing (contd.)

Kurt Kohorn, Ltd.
Lanzagorta/FIP
Lanzagorta/Inval
Mapegaz
Offshore Drilling Supplies, Ltd.
SMFI/Creusot-Loire
Sereg Schlumberger/Malbranque

HEADS - Casing, Subsea:

Kurt Kohorn, Ltd.

HEADS - Cementing:

Industrialexport
Mapegaz

HEADS - Circulating:

Industrialexportimport

HEADS - Control:

Industrialexport
Lanzagorta/Inval
Mapegaz

HEADS - Cylinder:

A/S Raufoss
Van Der Horst Asia Pte., Ltd.

HEADS - Drilling:

Canada

HEADS - Landing:

Canada
Kurt Kohorn, Ltd.

HEADS - Rotating:

Kurt Kohorn, Ltd.

HEADS - Stripper:

Kurt Kohorn, Ltd.

HEADS - Subsea:

Equipetrol S.A.
Kurt Kohorn, Ltd.

HEADS - Tubing:

Breda Fucine
Canada
Industrialexportimport
Kurt Kohorn, Ltd.
Lanzagorta/FIP
Mapegaz
SMFI/Creusot-Loire
Sereg Schlumberger/Malbranque

HEADS - Tubing, Multiple String:

Breda Fucine
Canada
Kurt Kohorn, Ltd.
Lanzagorta/FIP

HEADS - Tubing, Stripper:

Breda Fucine
Kurt Kohorn, Ltd.

HEADS - Tubingless Completion:

Kurt Kohorn, Ltd.

HEADS - Unitized, Casing & Tubing:

Breda Fucine
Kurt Kohorn, Ltd.
Mapegaz
Sereg Schlumberger/Malbranque

HEADS - Workover:

Kurt Kohorn, Ltd.

HEATERS - Derrick:

Northern Rig Lites

HEATERS - Direct & Indirect:

C. Goldhan
Robert Jenkins Oil & Gas
Porta-Test Systems, Ltd.
Siirtec

HEATERS - Oil:

Canadian Brown Steel Tank Co.
C. Goldhan-Lubeck Olfeldausrostungen
Offshore Drilling Suppliers, Ltd.

HEATERS - Steam Generating:

C. Goldhan
Offshore Drilling Supplies Limited

HEATERS - Tank:

C. Goldhan

HEATERS - Water:

Phoceenne De Metallurgie

HELICOPTER REFUELING EQUIPMENT:

New-Mar Oil Services, Ltd.

HOIST - Air:

Atlas Copco AB
Ceria
Industrialexportimport
Unitor Ships Service

HOIST - Drill Pipe:

A/S Moelven Brug
Offshore Drilling Supplies, Ltd.

HOISTS - Hydraulic:

A. S. Bergens Mekaniske Verk
Ceria
Hydraudyne B.V.
Hydraulik Brattvaag

HOISTS - Measuring Line:

Ceria

HOISTS - Portable:

Unitor Ships Service

HOLD-DOWNS - Liner Hanger:

Sea Oil Services, Ltd.

HOLD-DOWNS - Rod Pump:
Bolland & Cia
S.B.S.
Vereinigte Edelstahlwerke
HOOKS - Drill Pipe:

A/S Raufoss
Industrialexport

**HOOKS - Rod & Tubing:**

Industrialexportimport

**HOOKUPS - Production, Subsea:**

Comex Seal

**HOOKUPS - Well Completion:**

Comex Seal

**HOPPERS - Mud or Cement:**

Bharat Heavy Electricals, Ltd.
Industrialexport
Itag
Offshore Drilling Supplies, Ltd.

**HOSE - Air, Steam, Water, Oil, Gas, Fire, Etc.:**

Arbarthorpe Oilfield Services, Ltd.
Atlas Copco AB
Griflex Products, Ltd.
Gummi A/S K. Lund & Co.
Offshore Drilling Supplies, Ltd.
Paguag GmbH
T. I. Group
Treg, Div. of Pirelli
Unitor Ships Service AS

**HOSE - Blowout Preventer:**

Coflexip
Gummi A/S K. Lund & Co.

**HOSE - Cementing:**

Coflexip
Gummi A/S K. Lund & Co.

**HOSE - Dredging:**

Gummi A/S K. Lund & Co.
Treg, Div. of Pirelli

**HOSE - High Pressure:**

Coflexip
Gummi A/S K. Lund & Co.
New-Mar Oil Services, Ltd.
Paguag GmbH
T. I. Group

**HOSE - L P G:**

Coflexip
Gummi A/S K. Lund & Co.
T. I. Group
Treg, Div. of Pirelli

**HOSE - Plastic:**

Coflexip
Griflex Products, Ltd.
Gummi A/S K. Lund & Co.
T. I. Group

**HOSE - Rotary:**

Coflexip
Goes International Petroleum Services Pte., Ltd.
Greengate Industrial Polymers, Ltd.
Gummi A/S K. Lund & Co.
Industrias Pirelli, S.A.I. y C.
Offshore Drilling Supplies, Limited
Taurus Hungarian Rubber Works
Togawa Rubber Mfg. Co., Ltd.
Unitor Ships Service A/S

**HOSE - Steam Expansion:**

Gummi A/S K. Lund & Co.

**HOSE - Suction & Discharge:**

Gummi A/S K. Lund & Co.
Mento A/S
New-Mar Oil Services, Ltd.
Offshore Drilling Supplies Limited
T. I. Group
Treg, Div. of Pirelli

**HOSE - Welding:**

Gummi A/S K. Lund & Co.
Treg, Div. of Pirelli

**HOUSES - Bunk, Dining, Locker, Etc.:**

Irgens Larsen A.S.
T. I. Group
Tavernier-Houdy

**HOUSES - Canvas:**

Norseman Shelters, Ltd.
Tavernier-Houdy

HOUSES - Engine:

Norseman Shelters, Ltd.
Olympic Ironworks, Ltd.
Tavernier-Houdy

HOUSES - Instrument:

Tavernier-Houdy

HOUSES - Meter:

New-Mar Oil Services, Ltd.
Tavernier-Houdy

HOUSES - Mud:

CBCA I
Olympic Ironworks, Ltd.
Tavernier-Houdy

HOUSES - Power:

ACEP (France)
Olympic Ironworks, Ltd.
Tavernier-Houdy

HOUSES - Prefabricated:

Olympic Ironworks, Ltd.
T. I. Group
Tavernier-Houdy

HOUSES - Tool:

Olympic Ironworks, Ltd.
Tavernier-Houdy

HOUSING - Rig:

Norseman Shelters, Ltd.
Offshore Drilling Supplies, Ltd.
Olympic Ironworks, Ltd.

HOUSING - Storage:

Norseman Shelters, Ltd.
Offshore Drilling Supplies, Ltd.
Olympic Ironworks, Ltd.
Tavernier-Houdy

HOUSING - Wellhead, Subsea:

Olympic Ironworks, Ltd.
A/S Raufoss

HYPERBARIC - Centers:

Comex Industries
Creusot-Loire Engergie Developments

IMPELLERS:

Arbarthrope Oilfield Services, Ltd.
Offshore Drilling Supplies, Ltd.

INCINERATORS:

Irgens Larsen A/S
Motherwell Bridge Group

INCLINOMETERS:

Thomson CSF (D A S M)

INDICATORS - Anchor Windlass:

Ceria

INDICATORS - Crane Load:

Ceria

INDICATORS - Depth:

Ceria
Offshore Drilling Supplies, Ltd.
Tesel Services, Ltd.

INDICATORS - Directional Drilling:

Friedrich Leutert GmbH

INDICATORS - Drift:

Friedrich Leutert GmbH

INDICATORS - Drilling Control:

Offshore Drilling Supplies, Ltd.
Samega

INDICATORS - Flow:

Automotive Products, Ltd.
Samega

INDICATORS - Free Point:

Tesel Services, Ltd.

INDICATORS - Hole Fill-Up:

Dreco, Ltd.

INDICATORS - Liquid Level:

Samega
Tesel Services, Ltd.

INDICATORS - Mud Circulation Rate:

Samega

INDICATORS - Mud Pit Level:

Samega

INDICATORS - Mud Pressure:

Brisco Engineering, Ltd.
Offshore Drilling Supplies, Ltd.

INDICATORS - Mud Weight:

Samega
Unitor Ships Service AS

INDICATORS - Position:

Thomson - CSF (D A S M)

INDICATORS - Torque:

Samega

INDICATORS - Vessel Position:

GEC Group (England)

INDICATORS - Weight, Bottom Hole:

Samega

INDICATORS - Weight, Recording:

Samega

INDICATORS - Weight, Wire Line:

Ceria
Flopetrol
Industrialexportimport
Offshore Drilling Supplies, Ltd.

INHIBITORS - Corrosion:

CECA I
CECA II
Chemische Fabriek Servo
Drilltec GmbH
Goes International Petroleum Service
Pte., Ltd.

INHIBITORS - Corrosion (contd.)

Hoechst AG
Offshore Drilling Supplies, Ltd.
Unitor Ships Service

INJECTORS - Chemical:

Brisco Engineering, Ltd.
Costruzioni Hydro-Pneumatic
Goes International Petroleum Service Pte., Ltd.
Goldhan Olfeddausrustungen GmbH
Offshore Drilling Supplies, Ltd.

INJECTORS - Chemical, Bottom Hole:

Brisco Engineering, Ltd.

INJECTORS - Subsea Grease:

Brisco Engineering, Ltd.

INSERTS - Choke:

Canada

INSERTS - Slip & Spider:

Arbarthorpe Oilfield Services Ltd.
Offshore Drilling Supplies, Ltd.

INSERTS - Valve:

Sea Oil Services, Ltd.
Stabylia

INSPECTION - Casing:

T. I. Group
O. I. S.

INSPECTION - Drill Collars:

Breda Fucine
Sea Oil Services, Ltd.
O. I. S.

INSPECTION - Drill Pipe:

Breda Fucine
Sea Oil Services, Ltd.
T. I. Group
O. I. S.

INSPECTION - Magnetic Particle:

Breda Fucine
O. I. S.

INSPECTION - Pipe:

Breda Fucine
O. I. S.
T. I. Group

INSPECTION - Pipeline:

O. I. S.
T. I. Group

INSPECTION - Sucker Rod:

O. I. S.
T. I. Group

INSPECTION - Thread:

Inspection Tubular Goods - British Steel Corp.
Kuroda Precision Industries, Ltd.
O. I. S.
Sea Oil Services, Ltd.
T. I. Group

INSPECTION - Ultrasonic:

Breda Fucine
O. I. S.

INSPECTION - Weld:

Ateliers et Chantiers de Bretagne
O. I. S.

INSTRUMENTATION - Marine Drilling:

C G A/Alcatel
Mento A/S
Unitor Ships Service AS

INSTRUMENTATION - Platform:

Brisco Engineering, Ltd.

INSTRUMENTATION - Subsea:

Brisco Engineering, Ltd.

INSTRUMENTS - Directional Drilling Control:

Friedrich Leutert GmbH & Co.

INSTRUMENTS - Gas Meter:

New-Mar Oil Services, Ltd.
Phoceenne De Metallurgie

INSTRUMENTS - Oceanographic:

Thomson CSF (D A S M)

INSTRUMENTS - Pressure:

Brisco Engineering, Ltd.
Friedrich Leutert GmbH & Co.
Samega

INSTRUMENTS - Subsurface Pressure Gages:

Friedrich Leutert GmbH & Co.

INSTRUMENTS - Well Surveying:

Samega
Tesel Services, Ltd.
Western Hydraulic

INSULATION - Duct:

Elkem-Spirgerverket A/S

INSULATION - Fire:

Elkem-Spigerverket A/S

INSULATION - Pipe:

Elkem-Spigerverket A/S
Phoceenne De Metallurgie

JACKS - Casing:

Hydraudyne B.V.

JACKS - Gripper:

Hydraudyne, B.V.

JACKS - Hydraulic:

Ceria
Doncaster Moorside, Ltd.
Goes International Petroleum Service Pte., Ltd.
Hydraudyne B.V.

JACKS - Offshore Drilling Barge:

Hydraudyne B.V.

JACKS - Offshore Platform:

Hydraudyne B.V.

JACKS - Rig:

Brissonneau & Lotz Marine
Griffith Oil Tool, Ltd.
Hydraudyne B.V.
Olympic Ironworks, Ltd.

JACKS - Rig Skidding:

Hydraudyne B.V.
Olympic Ironworks, Ltd.

JARS - Bumper:

Goes International Petroleum Service
  Pte., Ltd.
Griffith Oil Tool, Ltd.
Industrialexportimport
Offshore Drilling Supplies, Ltd.
Sea Oil Services, Ltd.

JARS - Circulating:

Industrialexportimport
Offshore Drilling Supplies, Ltd.

JARS - Drilling, Mechanical:

Griffith Oil Tool, Ltd.
Industrialexportimport
Offshore Drilling Supplies, Ltd.
Sea Oil Services, Ltd.

JARS - Hydraulic:

Griffith Oil Tool, Ltd.
Offshore Drilling Supplies, Ltd.
Van Der Horst

JARS - Knuckle:

Industrialexportimport

JARS - Rotary:

Griffith Oil Tool, Ltd.
Industrialexportimport
Offshore Drilling Supplies, Ltd.

JARS - Safety Joint:

Industrialexportimport
Offshore Drilling Supplies, Ltd.

JARS - Wire Line:

Griffith Oil Tool, Ltd.
Industrialexportimport
Offshore Drilling Supplies, Ltd.

JOINTS - Ball:

Van Der Horst

JOINTS - Expansion:

BTR Silvertown, Ltd.
Phoceenne De Metallurgie
T. I. Group

JOINTS - Flex Offshore:

Comex Seal

JOINTS - Knuckle, Wire Line:

Flopetrol
Seaco

JOINTS - Pipe:

British Steel Corp.
Creusot-Loire/Pressure Vessels Div.
Nippon Kokan K.K.
Phoceenne De Metallurgie
SMFI/Creusot-Loire
Serck Audco Valves
Vallourec Export

JOINTS - Pup:

Drillcon Industries, Ltd.
Equipetrol S.A.
Hamblin & Glover Oilfield Services, Ltd.
Hunting Group
Lion Oil Tool
Offshore Drilling Supplies, Ltd.
SMFI/Creusot-Loire
SMFI/Marep

JOINTS - Riser, Subsea:

Comex Seal
Matra Offshore

JOINTS - Slip, Offshore:

Van Der Horst Asia Pte., Ltd.

JOINTS - Safety Drilling:

Arai Ironworks

JOINTS - Safety Tubing:

Arai Ironworks

JOINTS - Swivel:

(ACEP)
Creusot-Loire Energie Developments
Itag Celle
Offshore Drilling Supplies, Ltd.
Phoceenne De Metallurgie
Unitor Ships Service AS
Verinigte Edelstahlwerke AG

JOINTS - Tool:

Aker Norsco Contracting
Arai Iron Works Co., Ltd.
A/S Raufoss
Breda Fucine S.p.A.
Creusot-Loire - Div. Material De Forage
Csepel Works
Daido Steel Co., Ltd.
Dai-Ichi Sokuhan Works, Ltd.
Demco, Ltd.
Diamant Boart S.A.
Drillcon Industries, Ltd.
Equipetrol S.A.
Euro-Drill Equipment (UK), Ltd.
Fukuda Kogyo Co., Ltd.
G K N Group
Hermann Von RautenKranz, Internat-Tiefbohr GmbH & Co., KG ITAG
Horstmann Gauge & Metrology, Ltd.
Hunting Oilfield Services, Ltd.
Industrialexport
Intreprinderea De Tevi Roman
Intreprinderea De Utilaj Petrolier
Intreprinderea Mecanica Fina
Koruda Precision Industries, Ltd.
Lion Oil Tool Group
Mannesmann Handel AG
Mannesmannroehren-Werke AG
Mitsubishi Steel Mfg. Co., Ltd.
Morse/Hemco Corp.
Nippon Kokan K.K.
Nippon Kokan Tsugite Kabushiki Kaisha
Offshore Drilling Supplies, Ltd.
Petromeca
Rauma Repola Oy, Lokoma Div.
SMFI/Creusot-Loire
S.P.A. James Massarenti

JOINTS - Tool (contd.)

Deaco
Sea Oil Services, Ltd.
Stewart Ross & Co., Inc.
Sumitomo Metal Industries, Ltd.
Tahara Manufacturing Co., Ltd.
T. F. DeMexico, S.A.
T. I. Coventry Gauge, Ltd.
T. I. Group
Tokiwa Industrial Co., Ltd.
Tokyo Sokuhan Co., Ltd.
Tone Boring Co., Ltd.
Tru-Thread, Ltd.
TRW Mission Industria Ltd.
Tsukamoto Seiki Co., Ltd.
Union Industrielle et D'Entreprise
U.M.D. International
Vereinigte Edelstahlwerke A.G.
Wirth Maschinen-und Bohrgerate Fabrik
Yoshida Boring Machine Mfg. Co., Ltd.

JOINTS - Tool, Flush Joint:

Arai Ironworks
SMFI/Creusot-Loire

JOINTS - Tool, Threadless:

Arai Ironworks
Tsukamoto Seiki Co.

JOINTS - Tool, Tubing:

Arai Ironworks
British Steel Corp.
Drillcon Industries, Ltd.
Equipetrol S.A.
SMFI/Creusot-Loire
Van Der Horst Asia Pte., Ltd.
Vereinigte Edelstahlwerke AG

JOINTS - Universal:

Voith Getriebe

KELLYS:

Breda Fucine
Equipetrol S.A.
Lanzagorta/CM
Offshore Drilling Supplies Limited
SMFI/Marep
Vereinigte Edelstahlwerke

KELLYS - Hex Drive:

Drillcon Industries, Ltd.
Industrialexportimport

KELLYS - Square Drive:

Breda Fucine
Drillcon Industries, Ltd.
Equipetrol S.A.
Industrialexportimport
SMFI/Marep

KNIVES - Wire Line:

Flopetrol
Industrialexportimport
Seaco

KNOCK-OUTS - Free Water:

C. Goldhan
Robert Jenkins Oil & Gas
Novelles Applications Technologiques

LABOR - Contracting:

Brisco Engineering, Ltd.
Oil Industry Services A.S.

LADDERS - Telescopic:

Verhoef Aluminum Scheepsbouwindustrie

LANTERNS - Electric, Vaporproof:

T. I. Group

LANTERNS - Marine:

T. I. Group

LATCHES - Hydraulic, Subsea:

Hydraudyne B.V.

LATHES:

Ateliers Demoor S.A.

LIGHTING SYSTEMS - Navigational:

Northern Rig Lites

LIGHTS - Explosion Proof:

Atlas Copco AB

LIGHTS - Explosion Proof (contd.)
Atlas Copco AB
Northern Rig Lites
Rognon S.A.
T. I. Group
Unitor Ships Service A/S

LIGHTS - Flood:

Northern Rig Lites
T. I. Group

LIGHTS - Hand:

Northern Rig Lites
T. I. Group
Unitor Ships Service A/S

LIGHTS - Navigation:

New-Mar Oil Services, Ltd.
Northern Rig Lites

LIGHTS - Offshore:

Northern Rig Lites
T. I. Group

LIGHTS - Rig & Derrick:

Bharat Heavy Electricals, Ltd.
Northern Rig Lites
Offshore Drilling Supplies, Ltd.
T. I. Group

LIGHTS - Underwater:

Unitor Ships Service A/S

LINERS - Cemented:

Industrialexportimport

LINERS - De-Sander:

Industrialexportimport
Sigma Chemie, Ltd.

LINERS - Desilter:

Industrialexportimport
Sigma Chemie, Ltd.

LINERS - Pump:

Arbarthorpe Oilfield Services, Ltd.
BTR Silvertown, Ltd.

LINERS - Pump (contd.)
Bolland & Cia
G K N Group
Goes International Petroleum Services Pte., Ltd.
Industrialexportimport
Massarenti
Mento A/S
Offshore Drilling Supplies Limited
S.B.S.
Vereinigte Edelstahlwerke
LINERS - Tubing:

Industrialexportimport
Sandvik AB
Vallourec Export

LINES - Choke & Kill:

Gummi A/S K. Lune & Co.
Offshore Drilling Supplies, Ltd.

LINES - Gathering, Offshore:

Paguag GmbH & Co.

LINES - Hydraulic Control:

Gummi A/S K. Lund & Co.
Unitor Ships Service AS

LINES - Tail:

Sandvik AB

LINES - Tow & Anchor:

Elkem-Spirgerverket A/S
Hawkins & Tipson Repemakers
Hendrik Veder
United Ropeworks

LINING - Brake:

Offshore Drilling Supplies Limited

LINKS - Chain:

Elkem A/S
Hamanaka Chain Mfg. Co., Ltd.
Hendrik Veder

LINKS - Elevator:

Blohm & Voss AG
Creusot-Loire Energie Developments
Griffith Oil Tool, Ltd.

LINKS - Elevator (contd.)

Industrialexportimport
Offshore Drilling Supplies, Ltd.
Vereinigte Edelstahlwerke AG

LINKS - Pennant:

Elkem-Spigerverket A/S

LOCATORS - Tubing End:

Flopetrol

LOGGING - Caliper:

Hunting Group
Tesel Services, Ltd.

LOGGING - Cement Bond:

Hunting Group
Tesel Services, Ltd.

LOGGING - Collar:

Tesel Services, Ltd.

LOGGING - Density:

Hunting Group
Samega
Tesel Services, Ltd.

LOGGING - Drift:

Friedrich Leutert GmbH & Co.

LOGGING - Drilling Rate:

Samega

LOGGING - Electrical:

GEC Group
Tesel Services, Ltd.

LOGGING - Fluid Levels:

Samega
Tesel Services, Ltd.

LOGGING - Focused Current:

Tesel Services, Ltd.

LOGGING - Mineral:

Tesel Services, Ltd.

LOGGING - Mud Analysis:

Samega

LOGGING - Offshore Service Unit:

Flopetrol
Tesel Services, Ltd.

LOGGING - Pressure:

Friedrich Leutert GmbH
Samega

LOGGING - Radio Activity:

Hunting Group
Tesel Services, Ltd.

LOGGING - Stuck Pipe:

Tesel Services, Ltd.

LOGGING - Temperature:

Friedrich Leutert GmbH
Junting Group
Samega
Tesel Services, Ltd.

LOGGING - Velocity:

Tesel Services, Ltd.

LOST CIRCULATION - Materials:

Anchor Drilling Fluids, A/S
CECA I
CECA S.A.
Brinadd Co.

LUBRICANTS:

CECA I
CECA S.A.
Mento A/S
Offshore Drilling Supplies, Ltd.
Ultraglide Limited
Unitor Ships Service AS

LUBRICANTS - Packing:

AVA International, Inc.
Ultraglide Limited

LUBRICANTS - Thread:

Offshore Drilling Supplies, Ltd.
Ultraglide Limited

LUBRICANTS - Valve:

Kurt Kohorn, Ltd.
Serck Audco Valves
Ultraglide Limited

LUBRICANTS - Wireline:

Ultraglide, Ltd.

LUBRICATORS - Valve:

Brisco Engineering, Ltd.
Kurt Kohorn, Ltd.

MACHINE SHOP SERVICES:
Ateliers Demoor S.A.
Creusot-Loire Energie Developments
Massarenti
North Sea Exploration Services
Rotator Norway
Sea Oil Services, Ltd.
T. I. Group
Unitor Ships Service AS
Van Der Horst Asia Pte., Ltd.
Venezuela Oil Tool
Vivalo
MACHINES - Pipe Pulling:

Salzgitter Maschinen

MACHINES - Pipe Threading & Cutting:

Ateliers Demoor S.A.

MACHINES - Welding:

Brisco Engineering, Ltd.
G K N Group
Unitor Ships Service

MACHINING - Equipment:

Ateliers Demoor S.A.
Creusot-Loire Energie Developments
T. I. Group
Unitor Ships Service AS

MACHINING - Steel:

Creusot-Loire Energie Developments
James Fairley Steels

MAGNETS - Fishing:

Industrialexportimport
Kingston Instrument Co., Ltd.
Offshore Drilling Supplies, Ltd.

MAINTENANCE - On & Offshore:

Comex Seal
Elektro Union Offshore A/S
GEC-Elliott Process Automation, Ltd.
G K N Group
North Sea Exploration Services
Sofresid

MANAGEMENT - Project:

Comex Seal
Elektro Union Offshore A/S
G K N Group
Novelles Applications Technologiques
Seamore Oil & Gas Processing

MANDRELS - Drift:

J. Caslake, Ltd.
Offshore Drilling Supplies Limited
Sea Oil Services, Ltd.
Sigma Chemie, Ltd.

MANDRELS - Locking:

Brastech Industrial
Carlo, S.A.
Flopetrol
Impanex, S.A.
Malbranque
Seaco

MANDRELS - Sidepocket:

Teledyne Merla

MANDRELS - Tubing, Gas Lift:

Teledyne Merla

MANDRELS - Tubing Suspension:

Breda Fucine
Canada Works

MANIFOLDS - Blow-Out Preventer:

Industrialexportimport
Olympic Ironworks, Ltd.
Van Der Horst

MANIFOLDS - Cementing:

Industrialexportimport

MANIFOLDS - Flow Control:

Brisco Engineering, Ltd.
Creusot-Loire Energie Developments
Lanzagorta/FIP
Phoceenne De Metallurgie

MANIFOLDS - Hydraulic Pumping:

Hydraudyne B.V.

MANIFOLDS - Mud Line:

Kurt Kohorn, Ltd.
Olympic Ironworks, Ltd.

MASTS - Cantilever:

Bharat Heavy Electricals, Ltd.
Dreco, Ltd.
Industria Del Hierro, S.A. De C.V.
Industrialexportimport
Lanzagorta International, Inc.
Massarenti
Olympic Ironworks, Ltd.
Joseph Paris S.A.
Silvio Ballerini & C
U.I.E.

MASTS - Folding:

Industrialexportimport
Lanzagorta/FIP
Joseph Paris, S.A.

MASTS - Jacknife:

Dreco, Ltd.
Massarenti
Olympic Ironworks, Ltd.
Joseph Paris S.A.

MASTS - Portable:

ArmstrongWhitworth (Metal Inds), Ltd.
Dreco, Ltd.
Industria Del Hierro, S.A. De C.V.
Industrialexportimport
Lanzagorta/CM
Massarenti
The Oil Well Engineering Co.
Olympic Ironworks, Ltd.

MASTS - Slant Hole Drilling:

Olympic Ironworks, Ltd.
Joseph Paris S.A.

MASTS - Telescoping:

Creusot-Loire Energie Developments
Dreco, Ltd.
Industria Del Hierro, S.A. De C.V.
Industrialexportimport
Lanzagorta International
Massarenti
Olympic Ironworks, Ltd.
Salzgitter Maschinen
Vereinigte Edelstahlwerke AG
U.I.E.

MASTS - Tripod:

Lanzagorta/CM
Joseph Paris S.A.

METALS - Hard Surfacing:

Creusot-Loire Energie Developments
Lion Oil Tool

METERS - Combination Separator & Meter:

Basset-Bretagne-Loire
C. Goldhan
Robert Jenkins Oil & Gas

METERS - Current:

Thomson - CSF (D A S M)

METERS - Density:

Samega

METERS - Flow:

Flopetrol
Phoceenne De Metallurgie
Samega

METERS - Gas:

Teledyne Merla

METERS - Oil:

New-Mar Oil Services, Ltd.

METERS - Pit Lever:

Samega

METERS - Positive Volume:

C. Goldhan
New-Mar Oil Services, Ltd.

METERS - Resistivity:

Samega

METERS - Turbine:

Kurt Kohorn, Ltd.
New-Mar Oil Services, Ltd.

METERS - Velocity:

Ferranti, Ltd.

METERS - Water:

Kurt Kohorn, Ltd.
New-Mar Oil Services, Ltd.

MICROSCOPES - Chart Reading:

Friedrich Leutert GmbH & Co.

MICROWAVE - Systems:

Ferrenti, Ltd.

MILLS - Casing:

Industrialexportimport
Lor, Inc.
Offshore Drilling Supplies, Ltd.
SMFI/Creusot-Loire
Sea Oil Services, Ltd.

MILLS - Drill Collar & Drill Pipe:

Industrialexportimport
Lor, Inc.
Sea Oil Services, Ltd.

MILLS - Inside Fluted:

Sea Oil Services, Ltd.

MILLS - Junk:

Canamco Services & Supplies
Lion Oil Tool

MILLS - Junk (contd.)
Lor, Inc.
Offshore Drilling Supplies, Ltd.
SMFI/Creusot-Loire
Sea Oil Services, Ltd.

MILLS - Liner:
Lor, Inc.
Sea Oil Services, Ltd.

MILLS - Packer & Cement:
Industrialexportimport
Lor, Inc.
Sea Oil Services, Ltd.
Venezuela Oil Tool

MILLS - Pilot:
Industrialexportimport
Lion Oil Tool
Lor, Inc.

MILLS - Reamer:
Lor, Inc.
SMFI/Creusot-Loire
Sea Oil Services, Ltd.

MILLS - Round Nose:
Lor, Inc.
Offshore Drilling Supplies, Ltd.
Sea Oil Services, Ltd.

MILLS - Section:

Lor, Inc.

MILLS - Starting:

Lor, Inc.

MILLS - Taper:
Industrialexportimport
Lion Oil Tool
Lor, Inc.
Offshore Drilling Supplies, Ltd.
Sea Oil Services, Ltd.

MILLS - Tubing:
SMFI/Creusot-Loire
Sea Oil Services, Ltd.

MILLS - Tubing & Window:

Industrialexportimport
Lor, Inc.

MIXERS - Fluid:

Industrialexportimport
Plenty Group, Ltd.

MIXERS - Mud:

Dreco, Ltd.
Goes International Petroleum Services Pte., Ltd.
Industrialexportimport
Itag
Offshore Drilling Supplies, Ltd.
Silvio Ballerini & C
Unitor Ships Service AS

MODULES - Atmospheric Transfer:

Comex Industries

MODULES - Immersion Control:

Ateliers et Chanteirs de Bretagne

MONITORS:

C G A/Alcatel

MONITORS - B S & W:

C G A/Alcatel
Unitor Ships Service AS

MONITORS - Mud Circulation:

C G A/Alcatel

MOORING SYSTEMS:

A. S. Bergens Mekaniske Verk
Brissonneau & Lotz Marine
Bruce International
Ceria
Creusot-Loire Energie Developments
Elektro Union Offshore A/S
Elkem
Equipements Mecaniques et Hydrauliques
GEC Mechanical Handling
Hawkins & Tipson Ropemakers
Hendrik Veder
Hydraulik Brattvaag
Irgens Larsen A.S.
Kleber
Norsea A/S
Pusnes Mekaniske Versted
United Ropemakers
Vickers, Ltd.
Wharton Engineers

MOTORS - Electric:

Atuliers de Constructions Electriques de Charleroi

MOTORS - Electric (contd.)

Bharat Heavy Electricals, Ltd.
Brissonneau & Lotz Marine
GEC Machines
Goes International Petroleum Services
  Pte., Ltd.
Holec
Industrialexportimport
Jeumont-Schneider
Northern Rig Lites
Offshore Drilling Supplies, Ltd.

MOTORS - Hydraulic:

A. S. Bergens Mekaniske Verk
Brissonneau & Lotz Marine
Dowty Offshore, Ltd.
GEC Group
Hydraudyne B.V.
Industrialexportimport
Western Hydraulic

MOTORS - Waterproof:

Ateliers de Constructions Electriques
  de Charleroi
Brissonneau & Lotz Marine
Clarke Chapman, Ltd.
Holec
Rognon S.A.

MOUNTINGS - Vibration Control:

BTR Silvertown, Ltd.

MUD - Drilling:

Anchor Drilling Fluids A/S
B W Mud, Ltd.
CECA I
Hercules France S. A.
Hoechst AG
Norsk Hydro
Rhone-Poulenc Industries

MUD - Oil Base:

Anchor Drilling Fluids A/S
CECA I

MUD - Oil Emulsion:

Anchor Drilling Fluids A/S
CECAI

MULTIPLEXERS - Bob Control:

Matra Offshore

NETS - Cargo:

Elkem

NETS - Personnel Rescue:

Hendrik Veder

NETS - Personnel Transfer:

Hendrik Veder
United Ropeworks

NIPPLES - Blast:

Hunting Group

NIPPLES - Cage:

Lanzagorta/FIP

NIPPLES - Casing:

Dalmine S.P.A.
Industrialexportimport
Lanzagorta International, Inc.

NIPPLES - Hydraulic Choke:

Hydraudyne B.V.

NIPPLES - Landing:

Breda Fucine
Flopetrol

NIPPLES - No Go:

AVA International, Inc.

NIPPLES - Pipe:

Lanzagorta/FIP
T. I. Group

NIPPLES - Plain Choke:

Kingston Instrument Co., Ltd.
Lanzagorta International, Inc.

NIPPLES - Ported:

AVA International, Inc.

NIPPLES - Sub-Surface Pump:

Vereinigte Edelstahlwerke AG

NIPPLES - Swage:

Lanzagorta/FIP

NIPPLES - Tubing:

Dalmine
Industrialexportimport
T. I. Group

NOZZLES - Flow:

Phoceenne De Metallurgie

NOZZLES - Jet, Rock Bit:

Tsukamoto Seiki Company

NOZZLES - Mud Gun:

Dreco, Ltd.
Offshore Drilling Supplies, Ltd.

NUTS:

Doncasters Moorside, Ltd.
G K N Group
Phoceenne De Metallurgie

NUTS - Propellor Fitting:

Doncasters Moorside, Ltd.

OCEANOGRAPHIC - Data Gathering & Recording:

Ceria
Dowty Offshore, Ltd.
Thomson CSF AVS

OIL - Hydraulic:

Hydraudyne B.V.
Ultraglide Limited

OPENERS - Hole:

Drilling & Service
Goes International Petroleum Services Pte., Ltd.
Norsea A/S
SMFI/Creusot-Loire
Sea Oil Services, Ltd.

OPENERS - Hole (contd.)

J. K. Smit & Sons
Tsukamoto Seiki Co.

ORIENTATION - Bottom Hole:

Friedrich Leutert GmbH & Co.
Tesel Services, Ltd.

O-RINGS:

Lanzagorta International, Inc.

OVERSHOTS - Continuous Strings:

Offshore Drilling Supplies, Ltd.

OVERSHOTS - Releasing & Circulating:

Industrialexportimport
Offshore Drilling Supplies Limited
Sea Oil Services, Ltd.

OVERSHOTS - Rope Sockets:

Industrialexportimport

OVERSHOTS - Short Catch:

Industrialexportimport

OVERSHOTS - Sucker Rod:

Industrialexportimport
Offshore Drilling Supplies, Ltd.

OVERSHOTS - Tubing:

Goes International Petroleum Services Pte., Ltd.
Industrialexportimport

OVERSHOTS - Wire Line Fishing:

Diamant Boart S.A.
Flopetrol
Industrialexportimport

PACKERS - Anchor:

Industrialexportimport

PACKERS - By Pass:

AVA International, Inc.

PACKERS - Casing:

McAllister & Associates

PACKERS - Casing External:

Kleber

PACKERS - Casing Pump:

Offshore Drilling Supplies, Ltd.

PACKERS - Cup:

Industrialexportimport

PACKERS - Drillable:

Industrialexportimport
Okgt

PACKERS - Formation:

Okgt

PACKERS - Gravel:

Offshore Drilling Supplies, Ltd.

PACKERS - Hook Wall:

Okgt

PACKERS - Hydraulic Set:

AVA International, Inc.
Okgt

PACKERS - Inflatable:

Pronal
Kleber

PACKERS - Kelly, Rotating:

Offshore Drilling Supplies, Ltd.

PACKERS - Liner:

Industrialexportimport
Okgt
Venezuela Oil Tool

PACKERS - Permanent:

Carlo, S.A.
Flopetrol
Site Oil Tools, Ltd.

PACKERS - Production:

AVA International, Inc.

PACKERS - Pumpdown:

Industrialexportimport

PACKERS - Retrievable:
AVA International, Inc.
Industrialexportimport
SKA
Site Oil Tools

PACKERS - Slimhole:

Industrialexportimport

PACKERS - Squeeze:

Okgt

PACKERS - Thermal Recovery:

Industrialexportimport

PACKERS - Wireline:

Ava International, Inc.
Industrialexportimport
Tesel Services, Ltd.

PACKING - Pump:

Offshore Drilling Supplies, Ltd.

PACKING - Rubber:

Hallite, Ltd.
Regal Industrial Rubber CA
Sigma Chemie, Ltd.
Stabylia

PACKING - Stuffing Box:

Industrialexportimport
Okgt

PACKING - Swivel Wash Pipe:

W/Stabylia

PACKOFFS - Casing & Tubing:

AVA International, Inc.

PAINT:

Sigma Chemie, Ltd.

PANELS - Control:

Automotive Products, Ltd.
AVA International, Inc.
Brisco Engineering, Ltd.
Costruzioni Hydro-Pneumatic
Motherwell Bridge
Northern Rig Lites
P. D. Rasspe Sohne
Rotator Norway
Sigmund Pulsometer Pumps
Unitor Ships Service AS

PATCHES - Casing:

Offshore Drilling Supplies, Ltd.

PERFORATING:

Tesel Services, Ltd.

PERFORATING - Offshore Service Unit & Oriented:

Tesel Services, Ltd.

PERFORATORS - Jet, Pipe & Tubing:

Tesel Services, Ltd.

PERFORATORS - Tubing:

T. I. Group

PERMEAMETERS:

Ruska Instrument Corp.
Samega

PERSONNEL - Offshore:

Brisco Engineering, Ltd.
Comex Seal
North Sea Exploration Services
Porta-Test Systems, Ltd.
Tesel Services, Ltd.

PIGS - Inspection:

Barber Industries, Ltd.
Proval

PIGS - Scraper:

Barber Industries, Ltd.
Phoceenne De Metallurgie

PILE DRIVING - Underwater:

Motherwell Bridge

PILOTS - Auto:

Brisco Engineering, Ltd.

PILOTS - Hydraulic:

Baker CAC
Brisco Engineering, Ltd.
Hydraudyne B.V.

PILOTS - Pneumatic:

Baker CAC
Brisco Engineering, Ltd.

PILOTS - Safety Valve:

AVA International, Inc.
Baker CAC
Brisco Engineering, Ltd.
Kurt Kohorn, Ltd.

PIPE BENDING:

Creusot-Loire/Pressure Vessels Div.
Nippon Kokan K.K.

PIPE - Coated:

The Algoma Steel Corp.
Drillcon Industries, Ltd.
Mannesmann Handel AG
Mannesmannrohren-Werke
Motherwell Bridge Company
Nippon Kokan K.K.
Trouvay & Cauvin
Vallourec Export

PIPE - Drill:

Arbarthorpe Oilfield Services, Ltd.
Breda Fucine
British Steel Corp.
Dalmine
Drillcon Industries, Ltd.
Equipetrol S.A.
G K N Group
Goes International Petroleum Services Pte., Ltd
Industrialexportimport
Mannesmann Handel AG
Mannesmannrohren-Werke
Nippon Kokan K.K.
Offshore Drilling Supplies, Ltd.

PIPE - Drill (contd.)

Sumitomo Metal Industries
Trouvay & Cauvin
Trouvay Handel AG
United Casing Steel & Pipe, Ltd.
Vallourec Export

PIPE - Drill, Aluminum:

United Casing Steel & Pipe, Ltd.

PIPE - Drill, Flush Joint:

Industrialexportimport
Mannesmann Handel AG
Mannesmann Roehren-Werke AG
Sumitomo Metal Industries, Ltd.
United Casing Steel & Pipe, Ltd.
Vallourec Export

PIPE - Drill, Geophysical:

United Casing Steel & Pipe, Ltd.

PIPE - Drill, Heavy Wall:

Drillcon Industries, Ltd.
Equipetrol, S.A.
G K N Group
Mannesmann Handel AG
Mannesmann Roehren-Werke AG
Nippon Kokan K.K.
SMFI/Marep
Sumitomo Metal Industries, Ltd.
United Casing Steel & Pipe, Ltd.

PIPE - Drill, Integral Joint:

Breda Fucine
Industrialexportimport
Mannesmannrohre-Werke
United Casing Steel & Pipe Ltd.
Vallourec Export

PIPE - Drill, Integral Flush:

Breda Fucine
Drillcon Industries Ltd.
Mannesmann Handel AG
Mannesmannrohren-Werke
United Casing Steel & Pipe Ltd.
Vallourec Export

PIPE - Drill, Seamless:

Breda Fucine
British Steel Corporation
Mannesmann Handel AG
Mannesmannrohren-Werke
Nippon Kokan
Sumitomo Metal Industries
United Casing Steel & Pipe Ltd.
Vallourec Export

PIPE - Drill, Tubing:

Drillcon Industries Ltd.
Nippon Kokan K. K.
Norsea A/S
Offshore Drilling Supplies Ltd.
Sumitomo Metal Industries
Trouvay & Cauvin
United Casing Steel & Pipe Ltd.
Vallourec Export

PIPE - External Upset:

Dalmine S.P.A.
Drillcon Industries Ltd.
Mannesmannrohren-Werke
Nippon Kokan
Nippon Steel Corporation
Sumitomo Metal Industries
United Casing Steel & Pipe Ltd.
Vallourec Export

PIPE - Fabricated Structural Steel:

Bergrohr GMBH Herne
Bergrohr GMBH Siegen
Confab Industrial S.A.
Dragados & Construcciones, S.A.
Fuji Tekko Kabushiki Kaisha
Kawasaki Steel Corporation
Kokubo Tekkosho
Kolsch-Folzer-Werke AG
Mannesmannroehren-Werke AG
Nippon Kokan Kabushiki Kaisha
Nippon Steel Corporation
Nishimura Koki Company, Ltd.
Osaka Tetsuen Kikai Company, Ltd.
Sakai Iron Works Company, Ltd.
Sumitomo Metal Industries, Ltd.
Toa Gaigyo Company, Ltd.
Vallourec Export

PIPE - Fiberglass Epoxy:

Ciba-Geigy Pipe Systems
Ketech
Nippon Kokan K.K.
Phoceenne De Metallurgie
Sepna

PIPE - Flexible:

Conflexip
Paguag GmbH & Company
Paguag GmbH
T. I. Group

PIPE - Internal Upset:

Mannesmannrohren-Werke
Nippon Kokan K. K.
United Casing Steel & Pipe Ltd.
Vallourec Export

PIPE - Line:

The Algoma Steel Corporation
British Steel Corporation
Drillcon Industries Ltd.
Hoesch Roehrenwerke
Mannesmann Handel AG
Mannesmannrohren-Werke
Nippon Kokan
Nippon Steel Corporation
Paguag GmbH & Company
Paguag GmbH
Sandvik AB
Sumitomo Metal Industries Ltd.
T. I. Group
Trouvay & Cauvin
United Casing Steel & Pipe Ltd.
Vallourec Export

PIPE - Plastic:

Phillips Driscopipe, Inc.
Phillips Extruded Products, Inc.

PIPE - Plastic Coated:

Breda Fucine
Drillcon Industries Ltd.
Hoesch Roehrenwerke
Mannesmann Handel AG
Mannesmannrohren-Werke
Nippon Kokan K. K.
Phoceenne De Metallurgie
Sumitomo Metal Industries Ltd.
United Casing Steel & Pipe Ltd.
Vallourec Éxport

PIPE - Pre-Fabricated:

Creusot-Loire/Pressure Vessels Div.
Nippon Kokan K. K.

PIPE - Slotted or Perforated:
B & B
Dalmine
Sandvik AB
Sea Oil Services Ltd.
Servecio Hydrocarb

PIPE - Wash:

Equipetrol S. A.

PIPE - Welded:

British Steel Corporation
Hoesch Roehrenwerke
Kawasaki Steel Corporation
Mannesmann Handel AG
Mannesmannrohren-Werke AG
Nippon Kokan
Nippon Steel Corporation
Phoceenne De Metallurgie
Sandvik Ab
Sumitomo Metal Industries Ltd.
T. I. Group
Trouvay & Cauvan
Motherwell Bridge
Vallourec Export

PIPE LAYERS - Sub-Sea:

Ateliers et Chanteirs de Bretagne
Coflexip

PIPE LAYERS - Sub-Sea (Cont.):

Nippon Kokan K. K.
Wharton Engineers

PIPE-LINE - High Pressure:

Ciba-Geigy

PIPELINES - Flexible, Offshore:

Paguag GmbH & Company

PIPE & COUPLINGS

Acciaierie e Ferriere Lombarde FALCK
Acciaierie Tubificio Arvedi
ACINDAR, Industria Argentina de Aceros S.A.
Alessio Tubi S.p.A.
The Algoma Steel Corporation, Ltd.
Athens Pipe Works S.A.
British Steel Corporation, Tubes Div.
C. A. Conduven
Confab Industrial S.A.
Corinth Pipeworks
Csepel Works
C.V.G. Siderurgica del Orinoco C.A.
Dalmine Siderca S.A.I.C.
Dalmine S.p.A.
Eisenwerk-Gesellschaft Macimilianshutte mbH
Eschweiler Bergwerks-Verein AG
Estel Rohr AG
The Far East Machinery Company, Ltd.
F.I.T. Ferrotubi Corbetta S.p.A.
Fort Worth Pipe & Supply Company
HYLSA, S.A.
Hyundai Pipe Company, Ltd.
Ilssin Steel Company, Ltd.
The Indian Tube Company, Ltd.
Interprovincial Steel & Pipe Corp. ltd.
Interprinderea De Tevi Republica
Interprinderea De Tevi Roman
Kawasaki Steel Corporation
Korea Steel Pipe Company, Ltd.
Kosovska Metaina Industrija
Laminaciones de Lesaca, S.A.
Mannesmann S/A
Mannesmannrohren-Werke AG
Mario Maraldi S.p.A.
Maruichi Steel Tube Ltd.
Middle East Tube Company
Nippon Kokan Kabushiki Kaisha
Nippon Steel Corporation
Nova Hut Klementa Gottwalda, Narodni Podnik

### PIPE & COUPLINGS (Cont.):

Paderwerk Gebr. Benteler
Persico Pizzamiglio A.A.
Phoenix Steel Tube Company, Ltd.
Productos Tubulares Monclova, S.A.
Prudential Steel Ltd.
Pusan Steel Pipe Industrial Company, Ltd.
Rohrenwerke Bous/Saar GmbH
S.E.T.A., S.p.A., Societa Europea
    Tubifici e Acciaierie S.p.A.
Siam Di Tella Ltda. (Siat Div.)
SKF Steel
Stelco Inc.
Sumitomo Metal Industries, Ltd.
Transformaciones Metalurgicas Especiales, S.A.
Tubacero, S.A.
Tubacex, C.E. de Tubos por Extrusion, S.A.
Tubemakers of Australia Ltd., Steel Pipe Div.
Tubificio Dalmine Italsider S.p.A.
Tubos de Acero de Mexico, S.A.
Tubos Reunidos, S.A.
Uddeholms Atkiebolag, Tube Div.
Union Steel Mfg. Company, Ltd.
Usines a Tubes de la Meuse
Valexy
Vallourec
VALTI
Vitkovice Steel and Engineering Works of
    Klement Gottwald, Nat. Corp.
VOEST-ALPINE AG
Zeljezara Sisak

### PIPE THREADERS

Ateliers Demoor S.A
DEMCO, Ltd.
Hamblin Oilfield (Services), Ltd.
Kuroda Precision Industries, Ltd.
Nippon Kokan Tsugite Kabushiki Kaisha
Oilfield Mfg. Pte., Ltd.
Oilfield Tubular Services (S) Pte., Ltd.
Tamotsu Kogyo Kabushiki Kaisha
T.P.S. Industries, Ltd.
Tri-State Oil Tool (S) Pte., Ltd.
Tube Investments, Ltd.

### PIPE WORK - Fabricating:

North Sea Exploration Services

### PISTONS - Pump:

Bronzavia
Goes International Petroleum Services Pte., Ltd.
Industrialexportimport

### PISTONS - Pump (Cont.):

Offshore Drilling Supplies Ltd.
Stabylia

### PLANTS - Air:

Bharat Heavy Electricals Ltd.

### PLANTS - Crude Oil Treating:

Robert Jenkins Oil & Gas
Seamore Oil & Gas Processing

### PLANTS - Desulfurization:

Robert Jenkins Oil & Gas

### PLANTS - Electric:

ACEP
A. S. Bergens Mekaniske Verk
Bharat Heavy Electricals Ltd.
Elektro Union Offshore A/S
GEC Gas Turbines Ltd.
Holec Petbow Ltd.
Petbow Ltd.
Bertel O. Steen A/S
T. I. Group

### PLANTS - Hydrocarbon Recovery:

GKN Group
Robert Jenkins Oil & Gas
Novelles Applications Technologiques
Serck Baker
Siirtec

### PLANTS - Water Treatment:

GKN Group
Novelles Applications Technologiques
Motherwell Bridge Group
Offshore Drilling Supplies Ltd.
Serck Baker

### PLANTS - Waste Treatment:

Motherwell Bridge
Serck Baker
Canamco Services & Supplies

PLATES - Baffle:

Friedrich Leutert GmbH & Co.

PLATES - Steel:

Nippon Kokan Kabushiki Kaisha

PLATFORMS - Derrick:

Creusot-Loire Energie Developments
Dreco Ltd.
Lanzagorta International Inc.
Joseph Paris SA
Salzgitter Maschinen
U.I.E.

PLATFORMS - Offshore:

Creusot-Loire/Pressure Vessles Div.
Equipements Mecaniques et Hydrauliques
Industrialexportimport
Intermare Sarda
Lanzagorta International
Motherwell Bridge Group
Nippon Kokan K. K.
Redpath Dorman Long Ltd.
U.I.E.

PLATFORMS - Production, Automated:

Ceria B
Redpath Dorman Long Ltd.
GEC Group

PLATFORMS - Racking, Mast:

Dreco, Ltd.
Industria Del Hierro S.A. De C.V.
Olympic Ironworks Ltd.
Joseph Paris S. A.
Salzgitter Maschinen

PLATFORMS - Stabbing:

Dreco, Ltd.
Industria Del Hierro S.A. De C.V.
Joseph Paris Ltd.

PLUGS - Bull:

Breda Fucine
Lanzagorta/FIP
Offshore Drilling Supplies Ltd.
T. I. Group

PLUGS - Casing, Drill Pipe & Tubing:

Hamblin & Glover Oilfield Services Ltd.
Industrialexport
Kuroda Precision Industries Ltd.
Sigma Chemie Ltd.

PLUGS - Cementing:

Industrialexport
Sigma Chemie Ltd.

PLUGS - Cementing, Rubber:

B T R Silvertown Ltd.
Industrialexportimport
Kleber
Stabylia

PLUGS - Choke:

Kurt Kohorn Ltd.

PLUGS - Circulating:

Industrialexportimport

PLUGS - Expandable:

B T R Silvertown Ltd.

PLUGS - Gauge:

T. I. Group

PLUGS - Inflatable:

Kleber
Pronal

PLUGS - Packer:

AVA International Inc.
Industrialexport

PLUGS - Pneumatic:

Industrialexportimport

PLUGS - Sealing:

Kleber

PLUGS - Valve Removal:

Canada
Lanzagorta/FIP

PLUNGERS - Oil & Gas Well:

Teledyne Merla

PLUNGERS - Pump:

Hydraudyne B. V.
Industrialexportimport
Offshore Drilling Supplies Ltd.

PODS - Sub-Sea Control:

Dowty Offshore Ltd.
Matra Offshore

POROMETERS -

Ruska Instrument Co.
Samega

POWER UNITS - Diesel Skid:

Bofors/Nohab
Flopetrol
Industrialexport
Bertel O. Steen A/S
Offshore Drilling Supplies Ltd.

PRESSURE BOMBS -

Leotret

PRESSERS - Hydraulic:

Hydraudyne B. V.

PREVENTERS - Blowout:

B T R Silvertown Ltd.
Baker C A C
Goes Intl. Petroleum Services Pte. Ltd.
Griffith Oil Tool Ltd.
INdustrialexport
Norsea A/S
Offshore Drilling Supplies Ltd.
Rognon S. A.
Van Der Horst

PREVENTERS - Blowout, Annular:

Griffith Oil Tool Ltd.
Industrialexportimport
Van Der Horst Asia Pte. Ltd.

PREVENTERS - Blowout, Inside:

Griffith Oil Tool Ltd.
Offshore Drilling Supplies Ltd.

PREVENTERS - Blowout, Operating Units:

Industrialexportimport
Ohemco

PREVENTERS - Blowout, Ram Type:

Griffith Oil Tool Ltd.
Industrialexportimport
Van Der Horst Asia Pte. Ltd.

PREVENTERS - Blowout, Rotating:

Industrialexportimport

PREVENTERS - Blowout, Sub-Sea:

Industrialexportimport
Van Der Horst Asia Pte. Ltd.

PREVENTERS - Blowout, Wire Line:

Diamant Boart S. A.

PROBES - Sand:

Baker C A C
Flopetrol

PROBES - Temperature:

Jeaumont-Schneider
KSB (Klein, Schazlin & Becker)
Sigmund Pulsometer Pumps Ltd.

PRODUCTION - Single String, Multiple Zones:

AVA International Inc.

PRODUCTION - Sub-Sea Systems:

Ateliers de Constructions Electriques
de Sharleroi
British Steel Corporation
Comex Seal
Matra Offshore

PROPELLERS - Marine:

Ateliers et Chanteirs de Bretagne
Ceria
Comex Industries

PROTECTORS - Actuator Stem:

Sigma Chemie Ltd.

**PROTECTORS - Bowl:**

Hubner Gray GmbH
Sigma Chemie Ltd.

**PROTECTORS - Casing, Tubing & Drill Pipe:**

Arbarthorpe Oilfield Services Ltd.
Drillcon Industries Ltd.
Drilltec GmbH
Farr Oil Tool Inc.
Goes Intl. Petroleum Services Pte. Ltd.
Hamblin & Glover Oilfield Services Ltd.
Mape
Offshore Drilling Supplies Ltd.
Sigma Chemie Ltd.
Stabylia
Vallourec

**PROTECTORS - Coupling:**

Drilltech GmbH
Hamblin & Glover Oilfield Services Ltd.
Sigma Shemie Ltd.

**PROTECTORS - Crown Block:**

Sigma Chemie Ltd.

**PROTECTORS - Electrical Cable:**

Northern Rig Lites
Sigma Chemie Ltd.
T. I. Group

**PROTECTORS - Hydraulic Control Lift:**

Sigma Chemie Ltd.
Unitor Ships Service AS

**PROTECTORS - Kelly Sub:**

S M F I/Marep
Sigma Chemie Ltd.

**PROTECTORS - Thread:**

Breda Fucine
Drillcon Industries Ltd.
Drilltec GmbH
Hamblin & Glover Oilfield Services Ltd.
Lion Oil Tool
Offshore Drilling Supplies Ltd.
S M F I/Marep
Sibma Chemie Ltd.
Stabylia
Vereinigte Edelstahlwerke AG
Lor, Inc.

**PROTECTORS - Tool Joint:**

Breda Fucine
Drilltec GmbH
Sigma Chemie Ltd.
Vereinigte Edelstahlwerke AG

**PULLERS - Casing:**

Industrialexportimport

**PULLERS - Liner:**

Offshore Drilling Supplies Ltd.
SMF International

**PULLERS - Pump Piston:**

Ceria B
Offshore Drilling Supplies Ltd.

**PULLERS - Valve:**

SMF International

**PULLERS - Valve Seat:**

Offshore Drilling Supplies Ltd.
SMF International

**PULLEYS - Hay:**

Ansell, Jones & Company Ltd.

**PUMPING UNITS -**

Barber Industries
Cometarsa S.A.I.C.
Dominion Bridge Company Ltd.
Engrenages et Reducteurs
Hamilton Gear & Machine Co., Div. of Compro Ltd.
Intreprinderea Vulcan Bucuresti
LeGrand Industries, Inc.
Renn Industries Inc.
Rusco Hnos S. A.
Salzgitter Maschenin Und Anlagen AG
Siam Di Tella Ltda.
Universal Industries Ltd.
Vereinigte Edelstahlwerke AG

**PUMPS - Air/Gas Operated:**

Atlas Copco AB
Brisco Engineering, Ltd.
Costruzioni Hydro-Pneumatic
C. Goldhan
Hydraudyne B.V.
Unitor Ships Service A/S

### PUMPS - Blowout Preventer:

Industrialexportimport
Ohemco

### PUMPS - Booster:

Ateliers de Constructions Electriques
British Pump Company
Bronzavia
Creusot-Loire Energie Developments
Hydraudyne B. V.
Costruzioni Hydro-Pneumatic
Jeumont-Schneider
Sigmund Pulsometer Pumps
Van Der Horst Asia Pte. Ltd.

### PUMPS - Cable Suspended:

Mape

### PUMPS - Cement:

Creusot-Loire Energie Developments
Industrialexportimport
OPI, Inc.

### PUMPS - Centrifugal:

Arbarthorpe Oilfield Services Ltd.
Ateliers de Constructions Electriques
British Pump Company
Goes Intl. Petroleum Services Pte. Ltd.
Industrialexportimport
Jeumont-Schneider
KSB (Klein, Schanzlin & Becker)
Mento A/S
New-Mar Oil Services Ltd.
Offshore Drilling Supplies Ltd.
Plenty Group Ltd.
Sigmund Pulsometer Pumps Ltd.
Thune-Eureka A/S
Unitor Ships Services A/S

### PUMPS - Chemical:

Ateliers de Constructions Electriques
British Pump Company
Costruzioni Hydro-Pneumatic
Creusot-Loire Energie Developments
Jeumont-Schneider
New-Mar Oil Services Ltd.
OPI, Inc.
Offshore Drilling Supplies Ltd.
Sigmund Pulsometer Pumps
Teledyne Merla

### PUMPS - Diaphragm:

British Pump Company
New-Mar Oil Services Ltd.
Unitor Ships Services AS

### PUMPS - Duplex:

Alfred Wirth & Company KG
Industrialexport
Massarenti
Offshore Drilling Supplies Ltd.
Plenty Group Ltd.
Silvio Ballerini & Company
Van Der Horst Asia Pte. Ltd.
Vereinigte Edelstahlwerke AG
Wirth Maschinen-Und Bohrgerate-Fanrick

### PUMPS - Fire Fighting:

ACEP
Jeumont-Schneider
KSB (Klein, Schanzlin & Becker)
Sigmund Pulsometer Pumps
Thune Eureka A/S

### PUMPS - Fluid, High Pressure:

Dowty Offshore Ltd.
KSB (Klein, Schanzlin & Becker)
OPI, Inc.
Plenty Group Ltd.
Sigmund Pulsometer Pumps Ltd.
Voith Getriebe

### PUMPS - Fluid Powered:

Brisco Engineering Ltd.
Dowty Offshore Ltd.
KSB (Klein, Schanzlin & Becker)
Plenty Group Ltd.
Sigmund Pulsometer Pumps

### PUMPS - Glycol:

KSB (Klein, Schanzlin & Becker)
New-Mar Oil Services Ltd.
Plenty Group Ltd.
Offshore Drilling Supplies, Ltd.
Sigmund Pupsometer Pumps

### PUMPS - Hand Operated:

Brisco Engineering Ltd.
R O P

PUMPS - Hydraulic:

Ateliers de Constructions Electriques
Bonzavia
Doncasters Moorside Ltd.
Dowty Offshore Ltd.
GEC Group
Hydraudyne B.V.
Jeumont-Schneider
KSB (Klein, Schanzlin & Becker)
Marta Offshore
Plenty Group Ltd.
Sigmund Pulsometer Pumps
Voith Getriebe

PUMPS - Hydraulic, Downhole:

Hydraudyne B. V.
KSB (Klein, Schanzlin & Becker)

PUMPS - Hydrostatic Testing:

Brisco Engineering Ltd.
Costruzioni Hydro-Pneumatic
Hydraudyne B. V.

PUMPS - Jet Deepwell:
KSB (Klein, Schanzlin & Becker)
Plenty Group Ltd.

PUMPS - LPG:

Ateliers de Constructions Electriques
Sigmund Pulsometer Pumps

PUMPS - Mud Mixing:

Dreco, Ltd.
Industrialexportimport
KSB (Klein, Schanzlin & Becker)
Offshore Drilling Supplies Ltd.
Plenty Group Ltd.

PUMPS - Oil Well:

Ateliers de Constructions Electriques
Ceria B
Industrialexport
KSB (Klein, Schanzlin & Becker)
Offshore Drilling Supplies Ltd.
Sigmund Pulsometer Pumps
Sandvik AB
Vereinigte Edelstahlwerke

PUMPS - Pipeline:

Ateliers de Constructions Electriques
KSB (Klein, Schanzlin & Becker)
Plenty Group Ltd.
Sigmund Pulsometer Pumps

PUMPS - Piston Type:

Brisco Engineering Ltd.
Dreco Ltd.
Hydraudyne B. V.
Industrialexport
Massarenti
OPI, Inc.
United Ships Services
Wirth Maschinen-Und Bohrgerate-Fabrick

PUMPS - Plunger:

Brisco Engineering Ltd.
Dreco Ltd.
Export Oil Field Supply
Hydraudyne B. V.
Industrialexport
OPI, Inc.
Vereinigte Edelstahlwerke AG

PUMPS - Production:

KSB (Klein, Schanzlin & Becker)
Sigmund Pulsometer Pumps Ltd.

PUMPS - Production, Centrifugal/Submersible:

Jeaumont-Schneider
KSB (Klein, Schanzlin & Becker)

PUMPS - Production, Jet:

KSB (Klein, Schanzlin & Becker)

PUMPS - Production, Sucker Rod:

KSB (Klein, Schanzlin & Becker)
Vereinigte Edelstahlwerke AG

PUMPS - Proportioning:

R O P

PUMPS - Quintuplex:

Creusot-Loire Energie Developments

PUMPS - Reciprocating:

Brisco Engineering Ltd.
Creusot-Loire Energie Developments
Massarenti
OPI, Inc.
Vereinigte Edelstahlwerke

PUMPS - Rod:

Bompet de Venezuelez

PUMPS & PUMP PARTS -

Bolland & Cia. S.A.
Est. Mecanicos Jone S.A.O. y C.
Inpamex S.A.
Millingford Engineering Company, Ltd.
Petromecanica S.A.I. y C.
Quinn's Oilfield Supply Ltd.
Vereinigte Edelstahlwerke AG

PUMPS - Rotary Gear:

Brisco Engineering Ltd.
Engrenages Et Reducteurs/Citroen-Messian
KSB (Klein, Schanzlin & Becker)
Plenty Group Ltd.

PUMPS - Salt Water:

Industrialexportimport
KSB (Klein, Schanzlin & Becker)
Offshore Drilling Supplies Ltd.
Plenty Group Ltd.
Sigmund Pulsometer Pumps

PUMPS - Sand:

KSB (Klein, Schanzlin & Becker)
Vereinigte Edelstahlwerke

PUMPS - Screw:

KSB (Klein, Schanzlin & Becker)
Motherwell Bridge Group
Plenty Group Ltd.

PUMPS - Self Priming:

Sigmund Pulsometer Pumps Ltd.

PUMPS - Slurry:

Creusot-Loire Energie Developments
Dreco Ltd.
Industrialexport

PUMPS - Slurry (Cont.):

Jeumont-Schneider
Offshore Drilling Supplies Ltd.
Plenty Group Ltd.
Sigmund Pulsometer
Pumps Ltd.
Wirth Maschinen-Und Bohregerate-Fabrick

PUMPS - Slush:

Bharat Heavy Electricals Ltd.
Creusot-Loire Energie Developments
Dreco Ltd.
Industria Del Hierro S.A. De C.V.
Industrialexport
Jeumont-Schneider
KSB (Klein, Schanzlin & Becker)
Lanzagorta/C M
Massarenti
OPI, Inc.
Offshore Drilling Supplies Ltd.
Unitor Ships Service AS
Van Der Horst Asia Pte. Ltd.
Alfred Wirth & Company KG
Wirth Maschinen-Und Bohregerate-Fabrick

PUMPS - Steam:

KSB (Klein, Schanzlin & Becker)

PUMPS - Submersible:

ACEC
Jeumont-Schneider
KSB (Klein, Schanzlin & Becker)
Matra Offshore
Sigmund Pulsometer Pumps
Unitor Ships Service A/S

PUMPS - Sump:

KSB (Klein, Schanzlin & Becker)
Sigmund Pulsometer Pumps
Unitor Ships Services

PUMPS - Triplex:

Creusot-Loire Energie Developments
Dreco, Ltd.
Industrie Del Heirro S.A. De C.V.
Industrialexport
Lanzagorta/C M
Massarenti
OPI, Inc.

### PUMPS - Triplex (Cont.):

Offshore Drilling Supplies Ltd.
Ven Der Horst Asia Pte. Ltd.
Vereinigte Edelstahlwerke AG
Wirth Maschinen-Und Dohrgerate-Fabrick
Alfred Wirth & Company KG

### PUMPS - Vertical:

Ateliers de Constructions Electriques
Ceria B
Jeaumont Schneider
KSB (Klein, Schanzlin & Becker)
Plenty Group Ltd.
Sigmund Pulsometer Pumps

### PUMPS - Water:

Bharat Heavy Electricals Ltd.
Jeumont-Schneider
KSB (Klein, Schanzlin & Becker)
Sigmund Pulsometer Pumps

### PUMPS - Water Flooding:

KSB (Klein, Schanzlin & Becker)
Plenty Group Ltd.
Sigmund Pulsometer Pumps
Unitor Ships Service AS

### PUMPS - Water Well:

Industrialexportimport
Jeumont-Schneider
KSB (Klein, Schanzlin & Becker)
Sigmund Pulsometer Pumps Ltd.

### PUMPS - Well Acidizing, Cementing & Fracturing:

Creusot-Loire Energie Developments
Industrialexportimport
KSB (Klein, Schanzlin & Becker)
OPI, Inc.

### PURIFIERS - Water:

Serck Baker

### RACKS - Casing, Drill Pipe & Tubing:

Arbarthorpe Oilfield Services Ltd.
Industrialexportimport
Itag
Sigma Chemie Ltd.

### RACKS - Hose & Cable:

Industrialexportimport

### RACKS - Tubular Marine:

Sigma Chemie Ltd.

### RADIO - Communications:

Norsea A/S

### RAMS - Blowout Preventer:

Griffith Oil Tool Ltd.
INdustrialexportimport

### REACTORS -

Creusot-Loire/Pressure Vessels Div.

### REAMERS - Hole Opening:

Diamant Boart S.A.
Industrialexportimport
G K N Group
Offshore Drilling Supplies Ltd.
Lion Oil Tool

### REAMERS - Rotary:

Griffith Oil Tool Company
Industrialexportimport
S M F I/Marep

### REAMERS - Stabilizers:

GKN Group
Griffith Oil Tool, Ltd.
Lion Oil Tool, Ltd.
S M F I/Marep

### RECONDITIONING - Tool Joints, Etc.:

Lion Oil Tool
Sea Oil Services Ltd.
T. I. Group

### RECORDERS - Bore Hole Survey:

Friedrich Leutert GmbH & Company
Tesel Services Ltd.

### RECORDERS - Circulation Rate:

Samega

RECORDERS - Drift:

Friedrich Leutert GmbH & Company

RECORDERS - Drilling:

Samega
Unitor Ships Service AS

RECORDERS - Drilling Rate:

Offshore Drilling Supplies Ltd.
Samega

RECORDERS - Gas Temperature:

Friedrich Leutert GmbH & Company

RECORDERS - Liquid Level:

Samega

RECORDERS - Logging:

Samega
Tesel SErvices Ltd.

RECORDERS - Mud Flow:

Samega

RECORDERS - Mud Volume:

Samega

RECORDERS - Mud Weight:

Samega

RECORDERS - Pressure:

Brisco Engineering Ltd.
Flopetrol
Friedrich Leutert GmbH & Company

RECORDERS - R.P.M.:

Samega

RECORDERS - Rotary Speed:

Samega

RECORDERS - Rotary Torgue:

Samega

RECORDERS - Specific Gravity:

Samega

RECORDERS - Temperature:

Flopetrol
Friedrich Leutert GmbH & Company
Samega
Tesel Services Ltd.

RECORDERS - Tubing & Casing Pressure:

Samega

RECORDERS - Weight:

Samega
Unitor Ships Services AS

RECORDERS - Well Test:

Tesel Services Ltd.

RECTIFIERS - Electrical:

Elektro Union Offshore A/S
Jeumont-Schneider

REDUCERS - Speed, Geared:

CIT Alcatel (Gears)
Engrenages Et Reducteurs/Citroen-Messian
France Operator
Rademakers
Renold Power Transmissions, Ltd.
REELS - Hoses, Sub-Sea:

Ceria
New-Mar Oil Services Ltd.

REELS - Hydraulic Control Lines:

Ceria
New-Mar Oil Services Ltd.
Western Hydraulic

REELS - Measuring Line:

Ceria
Friedrich Leutert GmbH & Company
Western Hydraulic

REELS - Sand Line:

Friedrich Leutert GmbH & Company

REFRIGERATION - Equipment:

Novelles Applications Technologiques
Unitor Ships Services

REGULATORS - Gas:

GEC-Elliott Control Valves Ltd.

REGULATORS - Pressure:

Brisco Engineering Ltd.
Bronzavia
Camlow
Matra Offshore

RELAYS - Pneumatic:

Brisco ENgineering Ltd.

REPAIRS - Drill Collars:

Itag
Lion Oil Tool
Sea Oil Services Ltd.
T. I. Group

REPAIRS - Drill Pipe:

Itag
Sea Oil Services, Ltd.
T. I. Group

REPAIRS - Instrument:

Elektro Unoin Offshore A/S

REPAIRS - Offshore:

Creusot-Loire/Pressure Vessels Div.
Elektro Union Offshore A/S
G K N Group

REPAIRS - Pump:

OIP, Inc.

REPAIRS - Tool Joint:

Itag
Lion Oil Tool
Sea Oil Services Ltd.
T. I. Group

REPAIRS - Valve:

G K N Group
Kurt Kohorn Ltd.
Sea Oil Services Ltd.
Van Der Horst

RETAINERS - Cement:

Industrialexportimport

RETRIEVERS - Junk:

Offshore Drilling Supplies Ltd.

RIGS - Combination, Spider & Rotary:

Industrialexportimport
Massarenti
Salzgitter

RIGS - Drilling, Cable Tool:

Massarenti
S M F I/Creusot-Loire

RIGS - Drilling, Portable:

Dreco Ltd.
Industria Del Hierro S.A. De C.V.
Industrialexportimport
Knoll Rig & Equip. Mfg. Company
Massarenti
Offshore Drilling Supplies Ltd.
Olympic Ironworks Ltd.
S M F I/Creusot-Loire
Salzgitter Maschinen
Vereinigte Edelstahlwerke AG
Kin Rig Mfg.

RIGS - Drilling, Rotary:

Silvio Ballarini & Company
Bharat Heavy Electricals Ltd.
Creusot-Loire Energie Developments
Dreco Ltd.
Industria Del Hierro S.A. De C.V.
Industrialexportimport
Lanzagorta/C M
Massarenti
Offshore Drilling Supplies Ltd.
Olympic Ironworks Ltd.
Kin Rig Mfg.
S M F I/Creusot-Loire
Salzgitter Maschinen
Vereinigte Edelstahlwerke
Alfred Wirth & Company KG

RIGS - Drilling, Submersible:

Industrialexport

RIGS - Exploration:

Industrialexport
Bharat Heavy Electricals Ltd.
Industrialexportimport
Massarenti
Olympic Ironworks Ltd.
S M F I/Creusot-Loire
Salzgitter Maschinen

RIGS - Hydraulic:

Industrialexportimport
Kin Rig Mfg.

RIGS - Self-Propelled:

Kin Rig Mfg.
Knoll Rig & Equip. Mfg. Company
Offshore Drilling Supplies Ltd.
Olympic Ironworks Ltd.
Salzgitter Maschinen
Vereinigte Edelstahlwerke AG

RIGS - Tubing Servicing:

Industrialexportimport
Kin Rig Mfg.
Knoll Rig & Equip. Mfg. Company
Salzgitter Maschinen

RIGS - Water Well Drilling:

Diamant Boart S.A.
Industrialexport
Massarenti
Kin Rig Mfg.
Offshore Drilling Supplies Ltd.
Salzgitter Maschinen

RIGS - Workover:

Industrialexport
Kin Rig Mfg.
Knoll Rig & Equip. Mfg. Company
Massarenti
Offshore Drilling Supplies, Ltd.
Olympic Ironworks, Ltd.
Salzgitter Maschinen
Vereinigte Edelstahlwerke AG

RIMS - Brake:

Massarenti
Offshore Drilling Supplies Ltd.
Vereinigte Edelstahlwerke AG

RINGS - Piston

Offshore Drilling Supplies Ltd.

RINGS - Pump:

Offshore Drilling Supplies Ltd.

RINGS - Stuffing Box:

OFfshore Drilling Supplies Ltd.

RISERS - Flowline:

British Steel Corporation
Paguag GmbH

RISERS - Sub-Sea:

Ateliers et Chantiers de Bretagne
British Steel Corporation
Coflexip
Comex Seal
Creusot-Loire Energie Developments
Paguag GmbH

RODS - Piston:

Industrialexportimport
Massarenti

RODS - Polished:

Drillcon Industries Ltd.
Industrialexportimport
Vereinigte Edelstahlwerke AG

RODS - Pony or Sub:

Drillcon Industries Ltd.
Industrialexportimport
Mento A/S
Vereinigte Edelstahlwerke AG

RODS - Pull:

Ceria B

RODS - Pump:

Industrialexportimport
Offshore Drilling Supplies, Ltd.

RODS - Sucker:

Drillcon Industries Ltd.
Industrialexportimport
Kuroda Precision Industries Ltd.
Vereingte Edelstahlwerke

ROLLERS - Wireline:

Tesel Services Ltd.

ROPE - Mooring:

Elkem-Spigerverket A/S
Hawkins & Tipson Ropemakers
Norsk Staaltaugfabrik
United Ropeworks
Hendrik Veder

ROPE - Wire:

Creusot-Loire/Metallurgie
Elkem-Spigerverket A/S
G K N Group
Hawkins & Tipson Ropemakers
Norsk Staaltaugfabrik
Sandvik AB
Sociedad Franco Espanola
United Ropeworks
Hendrik Veder
Vereinigte Edelstahlwerke

ROTARY TABLES -

Bharat Heavy Electricals Ltd.
Interprinderea De Utilaj Petrolier
Rauma Repola Oy, Pori Works

RUBBER - Industrial, Molded, Custom:

B T R Silvertown Ltd.
Dowty Offshore Ltd.
Gummi A/SK. Lund & Company
Hallite Ltd.
Sigma Chemie Ltd.
Stabylia
Regal Industrial Rubber CA

RUBBERS - Blowout Preventers:

B T R Silvertown Ltd.
Goes Intl. Petroleum Services Pte. Ltd.
Mento A/S
Offshore Drilling Supplies Ltd.
Sigma Chemie Ltd.
Regal Industrial Rubber CA

RUBBERS - Packer:

B T R Silvertown Ltd.
Goes Intl. Petroleum Services Pte. Ltd.
Mento A/S
Sigma Chemie Ltd.

RUBBERS - Piston:

Sigma Chemie Ltd.
Stabylia

RUBBERS - Swab:

Phoceenne De Metallurgie
Sigma Chemie Ltd.
Stabylia
Regal Industrial Rubber CA

RUBBERS - Tubing Head:

Sigma Chemie Ltd.

RUNS-METER -

Phoceenne De Metallurgie

SAMPLERS - Bottom Hold:

Friedrich Leutert GmbH & Company

SAMPLERS - Gas:

Friedrich Leutert GmbH & Company

SAMPLERS - Liquid:

C. Goldhan
Friedrich Leutert GmbH & Company
Goldhan Olfeddausrustungen

SAVERS - Oil, Wireline:

Sigma Chemie Ltd.

SAWS -

Atlas Copco AB

SCABBARDS - Casing:

Industrialexportimport
Offshore Drilling Supplies Ltd.

SCABBARDS - Kelly:

Lion Oil Tool
S M F I/Marep

SCALERS - Weld Flux & Needle:

Atlas Copco AB

SCRAPERS - Pig:

Sigma Chemie Ltd.
Siirtec
Stabylia

SCRATCHERS - Cementing:

J. Caslake Ltd.
Sea Oil SErvices Ltd.

SCREEN - Sand Control:

Goes Intl. Petroleum Services Pte. Ltd.
Thule United Ltd.

SCREEN - Mud:

Anchor Drilling Fluids A/S
Norsea A/S
Thule United Ltd.

SCREENS - Vibrating:

Industrialexportimport
Salzgitter
Thule United Ltd.

SCREEN SETTING ASSEMBLIES:

Industrialexportimport

SCRUBBERS - Gas:

J. Caslake Ltd.
Porta-Test Systems Ltd.
Goldhan Olfeddausrustungen
C. Goldhan
Robert Jenkins Oil & Gas

SCRATCHERS - Cementing:
J. Caslake, Ltd.
Industrialexportimport
Regal Industrial Rubber CA
Sea Oil Services, Ltd.
SEALS - Blowout Preventers:

Offshore Drilling Supplies Ltd.

SEALS - Gasket:

Dowty Offshore Ltd.
Lanzagorta/F I P

SEALS - Mechanical:

Comex Industries
Dowty Offshore Ltd.
Hallite Ltd.

SEALS - Packoff, Secondary:

Canada
Lanzagorta/F I P

SEALS - Rotor:

Dowty Offshore Ltd.

SEATS - Choke Stem:

Briscoe Engineering Ltd.

SEATS - Pump Valve:
Bolland & Cia
Offshore Drilling Supplies Ltd.
Vereinigte Edelstahlwerke

SEATS - Valve:

Offshore Drilling Supplies Ltd.
Lanzagorta/F I P

SENSORS - Navigation:

Ferranti Ltd.
Thomson-CSF (D A S M)

SEPARATORS - Barites:

T. I. Group
Thule United Ltd.

**SEPARATORS - Cyclone:**

Automatic Oil Tools Systems
Industrialexportimport
Plenty Group Ltd.
Porta-Test Systems Ltd.
Thule United, Ltd.

**SEPARATORS - Defoaming:**

Porta-Test Systems Ltd.
Robert Jenkins Oil & Gas

**SEPARATORS - Equipment:**

Porta-Test Systems, Ltd.

**SEPARATORS - Filter:**

GKN Group
C. Goldhan
Mento A/S
Porta Test Systems, Ltd.
Plenty Group Ltd.
Sofrance

**SEPARATORS - Oil, Gas & Water:**

Adamson & Hatchett
Creusot-Loire/Pressure Vessels Div.
Hydraudyne B. V.
Goldhan-Olfeldausrustungen G.M.B.H.
Non Corrosive Metal Products Ltd.
Novelles Applications Technologiques
Phoceenne De Metallurgie
Plenty Group Ltd.
Porta-Test Mfg. Ltd.
Robert Jenkins Oil 7 Gas
Serck
Siirtec
Sofrance
Swecomex, S.A.

**SEPARATORS - Gas, Submersible:**

Automatic Oil Tools Systems
Plenty Group Ltd.

**SEPARATORS - Geothermal:**

Porta Test Systems, Ltd.

**SEPARATORS - Gumbo:**

Thule United Ltd.

**SEPARATORS - Low Temperature:**

Automatic Oil Tools Systems
Creusot-Loire/Pressure Vessels Div.
C. Goldhan
Porta-Test Systems Ltd.

**SEPARATORS - Metering:**

Automatic Oil Tools systems
C. Goldhan
Porta-Test Systems Ltd.
Robert Jenkins Oil & Gas
Siirtec

**SEPARATORS - Mud:**

Industrialexportimport
T. I. Group
Thule United Ltd.
Unitor Ship Service A/S

**SEPARATORS - Mud/Gas:**

Porta-Test Systems Ltd.

**SEPARATORS - Pipeline Crossing:**

Plenty Group Ltd.
Porta-Test Systems Ltd.

**SEPARATORS - Sand:**

G K N Group
Plenty Group Ltd.
Porta-Test Systems Ltd.
Thule United Ltd.

**SEPARATORS - Test:**

Automatic Oil Tools Systems
Porta-Test Mfg. Ltd.
Porta-Test Systems Ltd.
Robert Jenkins Oil & Gas
Goldhan Olfeddausrustungen

**SEPARATORS - Water:**

Atlas Copco AB
Porta-Test Systems Ltd.

**SERVICE - BOP Control:**

North Sea Exploration Services

SERVICE - Bottom Hole Pressure:

Flopetrol

SERVICE - Csg Threading, Coupling & Testing:

North Sea Exploration Services

SERVICE - Corrosion Inhibiting:

Hoechst AG
Sandvik AB
Chemische Fabriek Servo
Sofresid

SERVICE - Drift Indicator:

Friedrich Luetert GmbH & Company

SERVICE - Electrical:

Elektro Union Offshore A/S
Holec
North Sea Exploration Services
Northern Rig Lites

SERVICE - Fishing:

North Sea Exploration Services

SERVICE - Formation Analysis:

Flopetrol

SERVICE - Gravel Pack:

North Sea Exploration Services
Sea Oil Services Ltd.
Servecio Hydrocarb
SERVICE - Hydraulic Test Unit:

Western Hydraulic

SERVICE - Mud Analysis:

CECA 1

SERVICE - Paraffin Control:

Chemische Fabriek Servo

SERVICE - Pipe Cleaning, Perforating, Slotting, Threading, Etc.:

Lion Oil Tool
Sea Oil Services Ltd.

SERVICE - Power Tong:

North Sea Exploration Services

SERVICE - Production Testing:

Flopetrol

SERVICE - Sand Control:

Flopetrol
Sea Oil Services Ltd.
Servecio Hydrocarb
SERVICE - Tubing Handling:

Flopetrol

SERVICE - Water Analysis:

Chemische Fabriek Servo

SERVICE - Well Control:

Flopetrol
Samega

SERVICE - Wireline:

Sofrance
Tesel Services Ltd.
Western Hydraulic

SERVICE - Workover, Hydraulic:

Flopetrol
Kin Rig Mfg.

SEWAGE - Treatment:

Motherwell Bridge Group
Nippon Kokan K. K.

SHACKLES:

Ansell, Jones & Company, Ltd.
Bruce International
G K N Group

SHACKLES (Cont.):

Hamanaka Chain Mfg. Company, Ltd.
Hawkins & Tipson Ropemakers
Sea Oil SErvices Ltd.
United Ropeworks
Hendrik Veder

SHAKERS - Shale:

Dreco, Ltd.
Industrialexport
Offshore Drilling Supplies Ltd.
Salzgitter Maschinen
Silvio Ballerini & Company
Thule United, Ltd.

SHEAVES - Crown-Block, Catline, Gin Pole, Etc.:

Ansell, Jones & Company, Ltd.
Dreco, Ltd.
Griffith Oil Tool Ltd.
Hendrik Veder
Massarenti

SHEAVES - Deck:

Ansell, Jones & Company, Ltd.

SHEAVES - Subsea Hose & Cable:

Ansell, Jones & Company, Ltd.

SHEAVES - V-Belt:

Vereinigte Edelstahlwerke AG

SHEAVES - Wireline:

Bharat Heavy Electricals Ltd.
Massarenti

SHELTERS - Rig:

Bharat Heavy Electrical, ltd.
Norseman Shelters Ltd.
Offshore Drilling Supplies Ltd.

SHIPBUILDING -

Ateliers et Chanteirs de Bretagne
G H H Sterkrade

SHIPS - Drill:

Ateliers et Chanteirs de Bretagne
Nippon Kokan K. K.

SHIPS - Supply:

Ateliers et Chanteirs de Bretagne
Nippon Kokan K. K.

SHOES - Casing, Fill-Up:

Equipetrol S. A.
Sea Oil Services, Ltd.

SHOES - Casing, Float & Guides:

Industrialexportimport
Equipetrol S. A.
Sea Oil Services, Ltd.
Site Oil Tool Ltd.

SHOES - Liner Cementing:

Equipetrol S. A.
Industrialexportimport
Sea Oil Services Ltd.

SHOES - Milling:

Industrialexportimport
Offshore Drilling Supplies Ltd.

SHOES - Rotary:

Equipetrol S. A.

SHOES - Tubing:

Industrialexportimport

SHOES - Washover:

Diamant Boart S. A.
Drillcon Ind. Ltd.
J. K. Smit & Sons

SHOTBLASTING - Equipment:

Atlas Copco AB
Redpath Dorman Long
Unitor Ships Services AS

**SIGNALS** - Fog, Offshore:

Unitor Ships Service AS

**SILICONES**:

Sigma Chemie Ltd.

**SIMULATORS** - Deep Diving:

Comex Industries

**SKIDS** - Steel:

A. S. Normar
Creusto-Loire Energie Developments

**SKIMMERS** - Oil:

C. Goldhan
Goldhan Olfeddausrustungen
Novelles Applications Technologiques
Thune-Eureka A/S

**SLEEVES** - Liner:

Industria Del Hierro, S. A. De C. V.
Offshore Drilling Supplies Ltd.

**SLEEVES** - Separation:

Lanzagorta/F I P

**SLEEVES** - Split Pipe Repair

Trouvay & Chauvin

**SLEEVES** - Stage Cementing:

Sigma Chemie Ltd.

**SLINGS** - Wire Rope:

Elkem-Spigerverket A/S
G K N Group
Hendrik Veder
United Ropeworks

**SLIPS** - Casing & Tubing

Breda Fucine
Canada

Industrialexportimport
Offshore Drilling Supplies Ltd.
Tsukamoto Seiki Co.
Vereinigte Edelstahlwerke

**SLIPS** - Drill Collar:

Industrialexportimport
Offshore Drilling Supplies Ltd.
Tsukamoto Seiki Co.
Vereingte Edelstahlwerke

**SLIPS** - Drill Pipe:

Industrialexport
Offshore Drilling Supplies Ltd.
Silvio Ballerini & C
Tsukamoto Seiki Co.
Vereinigte Edelstahlwerke AG

**SLIPS** - Elevator:

Farr Oil Tool
Industrialexportimport
Mento A/S
Offshore Drilling Suppliers Ltd.

**SLIPS** - Multiple Tubing

Breda Fucine

**SLIPS** - Power:

Industrialexportimport

**SLIPS** - Spider:

Industrialexportimport

**SMELTERS** - Sulphur:

Barber Industries Ltd.

SNUBBERS - Boat:

B T R Silvertown Ltd.
Sigma Chemie Ltd.

SNUBBERS - Pressure:

Sigma Chemie Ltd.

SOCKETS - Ropes:

Flopetrol
G K N Group
Hendrik Veder
United Ropeworks

SOLVENTS - Paraffin:

Sigma Chemie Ltd.

SOLVENTS - Scale:

Sigma Chemie Ltd.

SONAR - Re-Entry Tools, Downhole:

Thomson-CSF (D A S M)

SONAR - Surveying, Search, Salvage:

Dowty Offshore Ltd.
Thomson-CSF (D A S M)

SOUNDERS - Well:

Friedrich Leutert GmbH & Co.
Tesel Services Ltd.

SPEARS - Casing:

Industrialexportimport
Offshore Drilling Supplies Ltd.

SPEARS - Circulating & Releasing:

Industrialexportimport

SPEARS - Drill Collar:

Industrialexportimport
Offshore Drilling Supplies Ltd.

SPEARS - Drill Pipe:

Industrialexportimport
Offshore Drilling Supplies Ltd.

Spears - Packer:

Industrialexportimport

SPEARS - Tubing:

Industrialexportimport

SPHERES - Inflatable:

Phoceenne De Metallurgie
Sigma Chemie Ltd.
Stabylia

SPIDERS - Casing & Tubing:

Industrialexportimport
Offshore Drilling Supplies Ltd.
Vereinigte Edelstahlwerke

SPIDERS - Drill Pipe:

Industrialexportimport
Offshore Drilling Supplies Ltd.
Vereinigte Edelstahlwerke

SPINNERS - Kelly:

Arbarthorpe Oilfield Services, Ltd.
Offshore Drilling Supplies Ltd.

SPOOLING - Wireline:

Ceria
Pusnes Mekaniske Verksted
Tesel Services Ltd.
Western Hydraulic

SPOOLS - Casing Head:

Industrialemportimport

SPOOLS - Drilling:

Canada Works
Griffith Oil Tool Ltd.
Industrialexportimport
Massarenti
Offshore Drilling Supplies Ltd.
S M F I/Creusot-Loire
Van Der Horst

SPOOLS - Geothermal Heat Expansion:

Barber Industries Ltd.

SPOOLS - Tubing Hanger:

Industrialexportimport

SPROCKETS - Chain:

Bharat Heavy Electricals, Ltd.
Renold Ltd.
Vereinigte Edelstahlwerke AG

STABBERS - Casing & Elevator Pipe:

Dreco Ltd.
Sigma Chemie Ltd.

STABBERS - Pipe:

Sigma Chemie Ltd.

STABBING BOARDS:

Dreco Ltd.

STABILIZERS - Casing:

Offshore Drilling Supplies Ltd.

STABILIZERS - Cushion:

Sigma Chemie Ltd.

STABILIZERS - Dead Line:

Dreco Ltd.

STABILIZERS - Diamond:

C. H. Taylor & Co., Ltd.
Cristal Profor S. A.
Diamant Boart S. A.
Drilling & Service
Goes International Petroleum

Industrial & Mining Bit Mfg.
J. K. Smit & Sons

STABILIZERS - Drill Collar:

Biamand Boart S. A.
Griffith Oil Tool, Ltd.
Hungting Group
Industrialexportimport
Industrial & Mining Bit Mfg.
Itag

STABILIZERS - Drill Collar (Con't)

Lion Oil Tool
Silvio Ballerini & C.
S M F I/Marep
Stabylia
C. H. Taylor & Co., Ltd.
Tsukamoto Seiki Co.
Van Der Horst
Vereinigte Edelstahlwerke AG

STABILIZERS - Drill Pipe:

Diamant Boart S. A.
Equipetrol S. A.
Fubriven De Venezuela
Hunting Group
Industrialexport
Norsea AS

STABILIZERS - Integral Blade:

Diamant Boart S. A.
Equipetrol S. A.
Griffith Oil Tool Ltd.
Hunting Group
Tsukamoto Seiki Co.
Vereinigte Edelstahlwerke AG

STABILIZERS - Kelly Sub:

Diamant Boart S.A.

STABILIZERS - Mill:

Diamant Boart S.A.
Lion Oil Tool

STABILIZERS - Non-Magnetic:

Hunting Group
S M F I/Marep
Vereinigte Edelstahlwerke AG

STABILIZERS - Packed Hole:

Diamant Boart S.A.
Griffith Oil Tool Ltd.

STABILIZERS - Replaceable Pad:

Equipetrol S. A.
Lion Oil Tool

STABILIZERS - Rubber:

B T R Silvertown Ltd.
Sigma Chemie Ltd.

STABILIZERS - Rubber (Con't)

S M F I/Marep
Stabylia

STABILIZERS - Sleeve:

Diamant Boart S. A.
Drilling & Service
Equipetrol S. A.
Lion Oil Tool
S M F I/Marep
Tsukamoto Seiki Co.

STABILIZERS - Spiral Blade:

Diamant Boart S. A.
Griffith Oil Tool Ltd.
Hunting Group
Vereinigte Edelstahlwerke AG

STABILIZERS - Tubing:

Diamant Boart S. A.

STACKS - Blowout Preventer, Sub-Sea:

Industrialexportimport
Van Der Horst Asia Pte. Ltd.

STAIR - Steel:

Arbarthorpe Oil Services Ltd.

STANDPIPES - Mud Line:

Bharat Heavy Electricals Ltd.
Brisco Engineering Ltd.
Dreco Ltd.
Olympic Ironworks Ltd.

STATIONS - Compressor:

Proceenne De Metallurgie
Unitor Ships Service A. S.

STEEL - Custom:

Compagnie Francaise Des Aciers Speciaux
Export Oil Field Supply
Usinor

STEEL - Plate:

Companie Francaise Des Aciers Speciaux
G K N Group
Nippon Kokan K. K.
Sandvik AB
Sumitomo Metal Industries, Ltd.
Usinor

STEEL - Stainless:

Sandvik AB

STEEL - Stockholders:

Compagnie Francaise Des Aciers Speciaux
G K N Group
Sandvik AB
James Fairley Steels
T. I. Group

STEEL - Structural:

British Steel Corporation
Compagnie Francaise Des Aciers Speciaux
Itag
Nippon Kokan K. K.
A/S Raufoss
Redpath Dorman Long Ltd.
Usinor

STEMS - Drill, Big Hole:

Massarenti

STOPS - Collar:

Sea Oil Services Ltd.

STRAINERS - Gas:

Automatic Oil Tools Systems
Porta-Test Systems Ltd.

STRAINERS - In-Line:

Automatic Oil Tools Systems
Porta-Test Systems, Ltd.

STRAINERS - Pipe, Air, Oil, Steam, Water:

Automatic Oil Tool Systems
J. Caslake Ltd.
Phoceenne De Metallurgie
T. I. Group

STRAPS - Tong:

Offshore Drilling Supplies, Ltd.

STRIPPERS - Tubing, Casing & Drill Pipe:

Goes International Petroleum Services
Pte. Ltd.

STRUCTURES - Offshore, Articulated:

Equipements Mecaniques et Hydrauliques
Intermare Sarda
Kawasaki Steel Corp.

STUDS:

Elkem-Spigerverket A/S
G K N Group
Trouvay & Cauvin

STUDS - Fluid End Pump:

Industria Del Hierro, S. A. De C. V.

STUDS - Hydraulically Operated:

Doncasters Moorside Ltd.

SUBMERSIBLE - Dry Transfer:

Comex Industries

SUBS - Bumper:

Griffith Oil Tool Ltd.
Lion Oil Tool
Offshore Drilling Supplies Ltd.
C. H. Taylor & Co., Ltd.

SUBS - Bumper, Sub-Sea:

C. H. Taylor & Co., Ltd.

SUBS - Casing & Tubing:

British Steel Corp.
Dalmine
Drillcon Ind. Ltd.
Hamblin & Glover Oilfield Services Ltd.
Industrialexportimport
Massarenti
Site Oil Tool, Ltd.
Vereinigte Edelstahlwerke AG

SUBS - Circulating:

Hunting Group
Lion Oil Tool

SUBS - Drill Collar:

Breda Fucine
Drillcon Industries Ltd.
Industrialexportimport
Lion Oil Tool
Massarenti
S M F I/Marep
Seaco
C. H. Taylor & Co., Ltd.
Vereinigte Edelstahlwerke AG

SUBS - Drill Pipe:
Breda Fucine
Drillcon Industries, Ltd.
Industrialexportimport
Lion Oil Tool
Massarenti
Offshore Drilling Supplies Ltd.
Sea Oil Services Ltd.
Seaco
Vereinigte Edelstahlwerke

SUBS - Equalizing:

Vereinigte Edelstahlwerke

SUBS - Junk:

Equipetrol S. A.
Hunting Group
Lion Oil Tool
S M F I/Marep

SUBS - Kelly Saver:

Breda Fucine
Drillcon Industries Ltd.
Lion Oil Tool
S M F I/Marep
Massarenti
Sea Oil Services Ltd.
Vereinigte Edelstahlwerke

SUBS - Lifting:

Breda Fucine
Drillcon Industries Ltd.
Ethyd
Hamblin & Glover Oilfield Services
Hunting Group

SUBS - Lifting (Con't)

Lion Oil Tool
S M F I/Marep
Sea Oil Services Ltd.
Vereinigte Edelstahlwerke

SUBS - Orientation:

Drillcon Industries Ltd.

SUBS - Top:

Equipetrol S. A.
Lion Oil Tool

SUB-STRUCTURES - Derrick, Mast & Rig:

Bharat Heavy Electricals, Ltd.
Comex Seal
Dreco, Ltd.
Industrialexport
Industrial Del Hierro S. A. de C. V.
Olympic Ironworks Ltd.
Silvio Ballerini & C.
Massarenti

SUCKER - Rods & Couplings:

Avan S.A.I.C.
Cometarsa S.A.I.C.
Drillcon Industries Ltd.
Stelco, Inc.
Vereinigte Edelstahlwerke A.G.

SUCKER - Rod Gages:

Alameda Gage Corp.
Kuroda Precision Industries Ltd.
TI Coventry Gauge Ltd.
Tru-Thread Ltd.

SUPPORTS - Pipe:

Nippon Kokan K. K.

SURFACANTS:

Hoechst AG
Sigma CHemie Ltd.

SURVEYS - Directional:

Friedrich Leutert GmbH & Co.
Tesel Services, Ltd.
Western Hydraulic

SURVEYS - Gyroscopic Directional:

Friedrich Leutert GmbH

SURVEYS - Magnetic:

Friedrich Leutert GmbH

SURVEYS - Pressure Bottom Hole:

Friedrich Leutert GmbH

SURVEYS - Temperature, Bottom Hole:

Friedrich Leutert Gmbh & Co.
Tesel Services, Ltd.

SWABS & PARTS:

Sigma Chemie Ltd.

SWITCHES - Daylight Sensitive:

GEC Machines

SWITCHES - Electrical:

Ateliers de Contructions Electriques
Dowty Offshore Ltd.
Elektro Union Offshore
Holec
Northern Rig Lites
T. I. Group

SWITCHES - Engine Safety:

Ateliers de Constructions Electriques
Dowty Offshore Ltd.

SWITCHES - Float:

Brisco Engineering, Ltd.
GEC Elliott Control Valves Ltd.
T. I. Group

SWITCHES - Limit:

Costruzioni Hydro-Pneumatic

SWITCHES - Pilot:

Brisco Engineering Ltd.

SWITCHES - Pneumatic:

Brisco Engineering Ltd.

SWITCHES - Pressure:

Brisco Engineering Ltd.
Bronzavia
GEC-Elliot Control Valves Ltd.
T.I. Group

SWITCHES - Pumping Unit Cut-Off:

Brisco Engineering Ltd.

SWITCHGEAR:

Ateliers de Constructions Electriques
Bharat Heavy Electricals Ltd.
Elektro Union Offshore A/S
T. I. Group

SWIVELS - Cargo:

Ansell, Jones & Co., Ltd.
Hendrik Veder

SWIVELS - Casing Rotating:

Offshore Drilling Supplies Ltd.

SWIVELS - Chains:

Ansell, Jones & Co., Ltd.
Hamanaka Chain Mfg. Co., Ltd.

SWIVELS - Drilling:

Bharat Heavy Electrical, Ltd.
Dreco Ltd.
Industrialexportimport
Lanzagorta/CM
Massarenti
Offshore Drilling Supply Ltd.
Salzgitter
Silvio Ballerini & C.
Vereinigte Edelstahlwerke AG

SWIVELS - Drilling, Large Diameter:

Industrialexport
Lanzagorta/C M

SWIVELS - Line:

CBV
Equipement Petrolier
Itag
Niigata Engineering Co.
Vitro, S. A.

SWIVELS - Power:

Industrialexportimport
Massarenti

SWIVELS - Rotary Hose:

Alfred Wirth & Co. KG
Wirth Maschinen-Und Bohrgerate-Fabrik

SWIVELS - Tubing:

Alfred Wirth & Co. KG
Industrialexportimport

SYSTEMS - AC-DC Power Conversion:

Bharat Heavy Electrical, Ltd.
Elektro Union Offshore A/S

SYSTEMS - Acoustic Ship-Positioning:

Dowty Offshore Ltd.
Thomson CSF (D A S M)

SYSTEMS - Air Package:

Bharat Heavy Electrical, Ltd.
G K N Group
Sigmund Pulsometer Pumps
Unitor Ships Service AS

SYSTEMS - Automation:

Ateliers de Constructions Electriques
Brisco Engineering Ltd.
Elektro Union Offshore A/S
Ferranti Ltd.
GEC Elliott Process Automation Ltd.
Matra Offshore

SYSTEMS - BOP Control:

Brisco Engineering, Ltd.
Industrialexportimport
Matra Offshore

SYSTEMS - BOP Control, Acoustic:

Matra Offshore
Thomson-CSF (D A S M)

SYSTEMS - Central:

Unitor Ships Service A. S.

SYSTEMS - Control Air:

Atlas Copco AB

SYSTEMS - Computer Control:

Ferranti Ltd.
GEC-Elliott Process Automation Ltd.
Matra Offshore
Samega

SYSTEMS - Cutting Washing:

Thule United Ltd.

SYSTEMS - Data Acquisition:

Elektro Union Offshore A/S
GEC-Elliott Process Automation Ltd.
Matra Offshore
Samega

SYSTEMS - Drill Collar Handling:

Arbarthorpe Oilfield Services, Ltd.
A/S Moelven Brug
Griffith Oil Tool Ltd.

SYSTEMS - Dynamic Positioning:

CIT Alcatel
GEC Electrical Projects Ltd.
Thomson-CSF AVS
Thomson-CSF (D A S M)

SYSTEMS - Electrical:

Ateliers et Chanteirs de Bretagne
Bharat Heavy Electrical, Ltd.
Dowty Offshore Ltd.
Elektro Union Offshore A/S
GEC Electrical Projects Ltd.
Holec
Jeumont-Schneider
Northern Rig Lites
T.I. Group

SYSTEMS - Fire Shut-in:

Unitor Ships Service AS

SYSTEMS - Geothermal Steam Control:

Porta-Test Systems, Ltd.

SYSTEMS - Heat Transfer:

G K N Group
Novelles Application Technologiques

SYSTEMS - Hydraulic Break-Out

Hydraudyne B. V.

SYSTEMS - Hydraulic Power:

A. S. Bergens Mekaniske Verk
Brisco Engineering Ltd.
Ceria
Dowty Offshore Ltd.
Ethyd
GEC Mechanical Handling
Hydraudyne B. V.
Olympic Ironworks, Ltd.
Costruzioni Hydro-Pneumatic
Van Der Horst
Western Hydraulic

SYSTEMS - Hydraulic Pumping:

Ceria B.
Dowty Offshore Ltd.
Hydraudyne B. V.
Sigmund Pulsometer Pumps

SYSTEMS - Liquid Storage & Transfer

New-mar Services Ltd.

SYSTEMS - Mud:

CECA 1
Silvio Ballerini & C.
Bharat Heavy Electrical Ltd.
Dreco Ltd.
Industrialexport
Industria Del Hierro S. A. De C. V.
Unitor Ships Service AS

SYSTEMS - Mud Cuttings, Handline & Washing:

Thule United Ltd.
Unitor Ships Service A. S.

SYSTEMS - Oil Recovery:

G K N Group
Lockheed Petroleum Services Ltd.
Novelles Applications Technologiques
Unitor Ships Service AS

SYSTEMS - Orifice Measurement:

Brisco Engineering Ltd.

SYSTEMS - Pipe Handling:

Arbarthorpe Oilfield Services Ltd.
Ateliers et Chanteirs de Bretagne
Drilltec GmbH
Sigma Chemie Ltd.
A/S Moelven Brug
A. S. Normar
Olympic Ironworks, Ltd.
Phoceenne De Metallurgie
Pronal

SYSTEMS - Power Pipe Handling:

Ateliers et Chanteirs de Bretagne

SYSTEMS - Production, Automated:

Brisco Engineering, Ltd.
Hubner Gray GmbH
Matra Offshore
Porta-Test Systems, Ltd.

SYSTEMS - Production, Sub-Sea:

Ateliers et Chanteirs de Bretagne
British Steel
Comex Seal
Lockheed Petroleum Services Ltd.
Matra Offshore

SYSTEMS - Reverse Circulation:

Industrialexportimport
Massarenti

SYSTEMS - Rig Skidding:

Brisco Engineering Ltd.
Brissonneau & Lotz Marine
Hydraudyne B. V.
Norseman Shelters Ltd.
Ohemco
Olympic Ironworks, Ltd.

SYSTEMS - Safety Valves Sub-Surface:

Brisco Engineering Ltd.
Costruzioni Hydro-Pneumatic
Flopetrol
France Operator

SYSTEMS - Safety Valves Surface:

Brisco Engineering Ltd.
France Operator
Costruzioni Hydro-Pneumatic

SYSTEMS - Salt Water Disposal:

G K N Group

SYSTEMS - Sewage & Waste Water Treatment:

G K N Group
Novelles Applications Technologiques
Sigma Chemie Ltd.

SYSTEMS - Subsea BOP Control:

Matra Offshore

SYSTEMS - Subsea Conductor Pipe:

British Steel Corp.

SYSTEMS - Subsea Well Control:

Brisco Engineering Ltd.
Comex Seal
Lockheed Petroleum Services Ltd.
Matra Offshore

SYSTEMS - Survival Offshore:

Unitor Ships Service SA

SYSTEMS - Telemetry:

Ferranti Ltd.
GEC-Elliott Process Automation Ltd.
Matra Offshore
Thomson-CSF (D A S M)

SYSTEMS - Thermal Recovery:

Novelles Applications Technologiques

SYSTEMS - Unloading:

Thule-Eureka AS

SYSTEMS - Vessel Position:

A. S. Bergens Mekaniske Verk
Thomson-CSF AVS

SYSTEMS - Well Control:

Brisco Engineering Ltd.

SYSTEMS - Well Control (Con't)

Lanzagorta/F I P
Matra Offshore

SYSTEMS - Wire Line Grease Injection:

Flopetrol

TABLES - Rotary:

Silvio Ballerini & C.
Bharat Heavy Electricals Ltd.
Dreco Ltd.
Industrialexportimport
Lanzagorta International Inc.
Massarenti
Salzgitter
Unitor Ships Service AS
Vereinigte Edelstahlwerke AG
Alfred Wirth & Co. KG
Wirth Machinen-Und Bohrgerate-Fabrick

TANKERS - Floating Storage:

Ateliers et Chanteirs de Bretagne
Nippon Kokan K. K.

TANKS - Cryogenic:

Motherwell Bridge Group
Nippon Kokan K. K.

TANKS - Filter:

New-mar Oil Services Ltd.

TANKS - Fuel:

Bharat Heavy Electrical Ltd.
Motherwell Bridge Group
New-mar Oil services, Ltd.
Nippon Kokan K. K.
Norseman Shelters Ltd.
Olympic Ironworks, Ltd.
Sigma Chemie Ltd.

TANKS - LPG:

Adamson & Hatchett
Motherwell Bridge Group
Nippon Kokan K. K.

TANKS - Meter Calibrating:

New-mar Oil Services Ltd.

TANKS - Mud:

Anchor Drilling Fluids A/S
Bharat Heavy Electronics Ltd.
Dreco Ltd.
Industrialexportimport
Itag
Lanzagorta/CM
Massarenti
New-Mar Oil Services Ltd.
Offshore Drilling Services, Ltd.
Olympic Ironworks, Ltd.
Rotator Norway AS
Silvio Ballerini & C.
Sigma Chemie Ltd.

TANKS - Oil Treating:

Nippon Kokan K. K.

TANKS - Portable:

Goes International Petroleum Services
Pte. Ltd.
Kleber
New-mar Oil Services Ltd.
Norseman Shelters Ltd.
Olympic Ironworks, Ltd.
Sigma Chemie Ltd.

TANKS - Storage:

Adamson & Hatchett
Arbarthorpe Oilfield Services Ltd.
Industrialexportimport
Kleber
Motherwell Bridge Group
New-mar Oil Services
Olympic Ironworks, Ltd.
Sigma Chemie Ltd.

TANKS - Testing:

Nippon Kokan K. K.
Sigma Chemie Ltd.

TANKS - Water:

Bharat Heavy Electricals, Ltd.
Kleber
New-mar Oil Services, Ltd.
Nippon Kokan K. K.
Norseman Shelter Ltd.
Olympic Ironworks, Ltd.
Sigma Chemie Ltd.

TEES - Cross:

Industrialexportimport

TEES - Cross (Con't)

Breda Fucine
Canada
Lanzagorta/F I P

TEES - Flow:

Breda Fucine
Canada Works
Hubner Gary GmbH
Lanzagorta/F I P
Phoceenne De Metallurgie

TEES - Pumping:

Breda Fucine
Industrialexportimport

TELECOMMUNICATIONS:

Elektro Union Offshore A/S
Ferranti Ltd.
Jeumont-Schneider
Matra Control Systems Div.

TELEPHONES:

Elektro Union Offshore A/S
GEC Electrical Projects Ltd.
Matra Control Systems

TELEPHONES - Underwater:

Comex Industries
Norsea A/S

TELEVISION - Underwater:

Norsea A/S

TENSIONERS - Guideline:

Hydraudyne B. V.
Van Der Horst Asia Pte. Ltd.

TENSIONERS - Pipelaying:

Ceria
Hydraudyne B. V.
Wharton Engineers

TENSIONERS - Riser, Subsea:

Hydraudyne B.V.
Van Der Horst Asia Pte. Ltd.
Wharton Engineers

TENSION - Meters, Rope & Meter:

GEC Mechanical Handling

TERMINALS - Electrical:

Klippon Electricals Ltd.

TESTERS - Blow Out Preventers:

Van Der Horst Asia Pte. Ltd.

TESTERS - Dead Weight:

Brisco Engineering Ltd.
Porta-Test Systems Ltd.

TESTERS - Formation:

Basset-Bretagne-Loire
Tesel Services Ltd.

TESTERS - Hydraulic:

Brisco Engineering Ltd.
Hydraudyne B.V.
Western Hydraulic

TESTERS - Multiple Zones:

Porta-Test Systems Ltd.

TESTERS - Oil-Gas Ratio:

Basset-Bretagne-Loire
C. Goldhan
Porta-Test Mfg. Ltd.

TESTERS - Well Production:

Flopetrol
C. Goldhan
Porta-Test Mfg. Ltd.

TESTING - Hydrostatic Pressure:

Brisco Engineering Ltd.
Costruzioni Hudro-Pneumatic
Van Der Horst Asia Pte. Ltd.

TESTING - Mud:

Anchor Drilling Fluids A/S

TESTING - Well:

Basset-Bretagne-Loire
Flopetrol
Porta-Test Systems Ltd.
Tesel Services Ltd.

THERMOMETERS - Recording:

Friedrich Leutert GmbH & Co.
Samega

THERMOSTATS:

Friedrich Leutert GmbH & Co.

THERMO COUPLES:

Klippon Electricals Ltd.

THIMBLES:

Hawkins & Tipson Ropemakers
United Ropeworks
Hendrik Veder

THINNERS - Drilling Mud:

CECA SA
Norsk Hydro
Sigma Chemie Ltd.

THRUSTERS - Marine:

Ateliers et Chanteirs de Bretagne
Ceria

TONGS - Backup:

Farr International Co., Ltd.

TONGS - Casing, Drill Pipe & Tubing:

Farr International Co., Ltd.
Goes International Petroleum Co.
Industrialexportimport
Mento A/S
Offshore Drilling Supplies Ltd.
Tsukamoto Seiki Co.
Vereinigte Edelstahlwerke

TONGS - Chain:

Arbarthorpe Oilfield Services Ltd.
Industrialexport

TONGS - Drill Pipe Spinning:

Offshore Drilling Supplies Ltd.

TONGS - Macroni:

Farr International Co., Ltd.

TONGS - Pipe:

Farr International Co., Ltd.
Industrialexport
Offshore Drilling Supplier Ltd.
Tsukamoto Seiki Co.

TONGS - Pipe Pulling:

Farr International Co., Ltd.

TONGS - Power:

Farr International Co., Ltd,
Industrialexport
Offshore Drilling Supplier, Ltd.

TONGS - Sucker Rod, Powered:

Industrialexportimport

TOOLS - Back Pressure Valve Removal:

Canada
Canada Works
Industrialexport

TOOLS - Back-Off:

Tesel Services Ltd.

TOOLS - Fishing:

Equipetrol S.A.
Friffith Oil Tool Ltd.
Industrialexport
Lion Oil Tool
Offshore Drilling Supplies Ltd.
Norsea A/S

TOOLS - Fishing, Cable Tool:

Industrialexportimport
Massarenti
Unitor Ships Service AS

TOOLS - Pipe:

Arbarthorpe Oilfield Services Ltd.
Ateliers Demoor S.A.
Farr International, Ltd.
Goes International Petroleum Services Pte. Ltd.
Offshore Drilling Supplies, Ltd.

TOOLS - Drill Stem Test:

McAllister & Associates

TOOLS - Drilling:

Empresas Mito Juan

TOOLS - Hand:

Saut-Du-Tarn
Unitor Ships Services AS

TOOLS - Pipe Beveling, Cutting & Threading:

Ateliers Demoor S.A.
Unitor Ships Service AS
Vallourec Export

TOOLS - Power:

Unitor Ships Service AS

TOOLS - Pneumatic:

Atlas Copco AB
Unitor Ships Services

TOOLS - Pulling, Hydraulic:

Hydraudyne B.V.

TOOLS - Pumpdown:

Unitor Ships Services AS

TOOLS - Running & Retrieving, Sub-Sea:

Comex Seal

TOOLS - Vibration:

Geomecanique

TOOLS - Wire Rope Cutting:

Unitor Ship Services AS

TORCHES - Welding & Cutting:

GKN Group
Unitor Ships Services

TOWERS - Access:

Verhoef Aluminum Scheepsbouwindustrie

TOWERS - Service:

Verhoef Aluminum Scheepsbouwindustrie

TOWERS - Sulphur Pouring:

Barber Industries, Ltd.

TOWING - Systems:

Skagit Corp.
Wharton Engineers

TRAILERS - Field, Office, Crew, etc.:

Tavernier-Houdy

TRAILERS - Mud Logging:

Samega
Tavernier-Houdy

TRAILERS - Mud Pump:

Dreco Ltd.
Tavernier-Houdy

TRAILERS - Portable Rig:

Dreco Ltd.
Kin Rig Mfg.
Massarenti

TRAILERS - Power Plant:

Bertel O. Steen A/S
Industrialexportimport
Tavernier-Houdy

TRAILERS - Wireline:

Flopetrol

TRAILERS - Rockover:

Dreco Ltd.

TRAINING - Personnel:

Anchor Drilling Fluids A/S
CECA SA
Flopetrol

TRANDUCERS:

Thomson-CSF (D A S M)

TRANSFORMERS:

Ateliers de Contructions Electriques de Charleroi
Elektro Union Offshore A/S
Jeumont-Schneider
Northern Rig Lites

TRANSMISSIONS:

Voith Getriebe

TRANSMITTERS - Mud Flo Rate:

Samega

TRAPS - Line Scraper:

Itag
Phoceenne De Metallurgie

TRAPS - Sand:

Industrialexport
Olympic Ironworks Ltd.

TRAPS - Scraper:

Siirtec

TREATERS - Combination Oil & Gas:

C. Goldhan
Robert Jenkins Oil & Gas
Siirtec

TREATERS - Crude Oil:

Siirtec

TREATERS - Electrochemical:

C. Goldhan

TREATERS - Emulsion:

C. Goldhan
Robert Jenkins Oil & Gas

TREATERS - Metering:

C. Goldhan
Siirtec

TREATERS - Water:

GKN Group

TRUCKS - Cement:

Industrialexportimport

TRUCKS - Logging:

Tesel Services Ltd.

TRUCKS - Perforating:

Tesel Services Ltd.

TRUCKS - Rigs:

Kin Rig Mfg.

TRUCKS - Wireline:

ASEP BV Holland
Flopetrol
Tesel Services Ltd.

TUBES - Barrel:

Diamant Boart S.A.
T.I. Group
Vallourec

TUBES - Boiler & Condenser:

Hoesch Roehrenwerke
Mannesman Handel AG
Mannesman Roehren-Werke AG
Nippon Kokan K.K.
Sandvik AB
T.I. Group

TUBES - Finned:

Nippon Kokan K.K.
Sumitomo Metal Industries, Ltd.
Vallourec

TUBES - Flow:

Phoceenne De Metallurgie
Sumitomo Metal Industries, Ltd.
T.I. Group

TUBES - Venturi:

Phoceenne De Metallurgie

TUBING - Capillary:

Vallourec Export

TUBING - Concentric:

Nippon Steel Corp.

TUBING - Control Line:

Nippon Steel Corp.

TUBING - Fiberglass:

Ketech
Sepma
Trouvay & Cauvin

TUBING - Instrument:

Sandvik AB
T.I. Group

TUBING - Integral Joint:

British Steel Corporation
Dalmine
Mannesman Mann Handel AG
Mannesmann Roehren-werke AG
Nippon Steel Corp.
United Casing Steel & Pipe Ltd.
Vallourec Export

TUBING - Oil & Gas Well:

British Steel Corp.
Dalmine
Drillcon Industries Ltd.
GKN Group
Hamblin & Glover Oilfield Services Ltd.
Kawasaki Steel Corp.
Mannesmann Handel AG
Mannesmann Roehren-werke AG
Nippon Kokan
Nippon Steel Corp.
Norsea A/S
Offshore Drilling Suppliers, Ltd.
Sandvik AB
Sumitomo Metal Industries
United Casing Steel & Pipe Ltd.
Vallourec Export

TUBING - Steel, Seamless:
Algoma Steel Corp.
British Steel Corp.
James Fairley Steels
G K N Group
Kawasaki
Kuroda Precision
Mannesmann Handel AG
Mannesmannrohren-Werke
Nippon Kokan
Nippon Steel Corp.
Sandvik AB
Sumitomo Metal Industries
Trouvay & Cauvin
United Casing Steel & Pipe, Ltd.
Vallourec Export
TUNGSTEN-CARBIDE:

Lion Oil Tool
S M F I/Marep

TURBINES - Steam or Gas:

Bharat Heavy Electricals Ltd.
Creusot-Loire Energie Developments
GEC Gas Turbines Limited
Hispano-Suiza

### TURBINES - Steam or Gas (Con't)

Klockner-Humboldt-Deutz
Mitsui Eng. & Shipbuilding
Nippon Kokan K.K.
Ruston Gas Turbines
Thomassen

### TURNBACKS - Wireline:

Stabylia

### UNDERREAMERS:

Drilling & Service

### UNIONS - Hammers:

CBV
Equipement Petrolier
Goes International Petroleum Service Pte. Ltd.
Itag Celle
Kurt Kohorn
Niigata Engineering Co.
Offshore Drilling Supplies, Ltd.
Phoceenne De Metallurgie
Vitro, S.A.

### UNIONS - High Pressure:

Brisco Engineering Ltd.
CBV
Equipement Petrolier
Itag Celle
Kurt Kohorn Ltd.
T.I. Group
Vitro, S.A.

### UNIONS - Lug:

Arbarthorpe Oilfield Services Ltd.
C.B.V.
Equipement Petrolier
Kurt Kohorn Ltd.
Niigata Engineering Co.
Vitro, S.A.

### UNIONS - O-Ring:

Dowty Offshore Ltd.

### UNIONS - Orifice:

Phoceenne De Metallurgie

### UNIONS - Pipe:

Itag Celle
Sandvik AB
T.I. Group

### UNIONS - Quick:

Itag Celle

### UNIONS - Welding:

Itag Celle
Kurt Kohorn Ltd.
Phoceenne De Metallurgie
Sandvik AB

### UNITS - Blowout Preventor Operating:

Industrialexport

### UNITS - Combo, Heating & Separting:

C. Goldhan
Novelles Applications Technologiques

### UNITS - Desalting:

Robert Jenkins Oil & Gas

### UNITS - Dry Dessicants:

Sigma Chemie Ltd.

### UNITS - Gravel Packing:

Sea Oil Services Ltd.

### UNITS - Hydraulic Power

Brisco Engineering Ltd.
Ceria
Dowty Offshore Ltd.
Ethyd
Farr International Co. Ltd.
Flopetrol
GEC Mechanical Handling
Costruzioni Hydro-Pneumatic
Hydraudyne B.V.
Pusnes Mekaniske Verksted
Rotator Norway A.S.
Bertel O. Steen A/S
Wharton Engineers
Olympic Ironworks, Ltd.

### UNITS - Hydraulic Power, Portable:

Automotive Products Ltd.
Doncasters Moorside Ltd.
Dowty Offshore Ltd.
Farr International Co., Ltd.
Flopetrol
Hydraudyne B.V.

UNITS - Hydraulic Power, Portable (Con't)

Costruzioni Hydro-Pneumatic
Wharton Engineers

UNITS - Hydrocarbon Recovery:

Novelles Applications Technologiques

UNITS - Offshore, Production Platform:

Ceria B
Creusot-Loire/Pressure Vessels Div.
Equipements Mecaniques et Hydrauliques
Industrialexportimport
Motherwell Bridge Group
Oil Industry Services AS
Porta-Test Systems, Ltd.
Seamore Oil & Gas Processing
Siirtec

UNITS - Packer Sealing:

Okgt
Sigma Chemie Ltd.

UNITS - Production Service:

ACEP
Industrialexportimport
Novelles Applications Technologiques
Porta-Test Mfg. Ltd.

UNITS - Pumping:

Ceria B
Creusot-Loire Energie Developments
GEC Gas Turbines Ltd.
Goes International Petroleum Services Pte. Ltd.
Industrialexport
OPI, Inc.
Ruston Gas Turbines
Salzgitter Maschinen
Bertel O. Steen A/S

UNITS - Pumping, Hydraulic:

Automotive Products Ltd.
Ceria B
Dowty Offshore Ltd.
Hydraudyne B.V.

UNITS - Pumping, Sucker Rod:

Salzgitter

UNITS - Ship Propulsion:

ACEP
Ateliers et Chanteirs de Bretagne
Ceria
Dowty Offshore Ltd.
Bertel O. Steen A/S

UNITS - Skid Mounted Pumping:

ACEP
Ceria B
Industrialexportimport
Salzgitter Maschinen
Bertel O. Steen A/S

UNITS - Snubbing:

B T R Silvertown Ltd.
Flopetrol

UNITS - Stage Separation:

C. Goldhan
Robert Jenkins Oil & Gas
Novelles Applications Technologiques
Porta-Test Systems Ltd.

UNITS - Sulphur Recovery

Barber Ind. Ltd.

UNITS - Tubing Service:

Industrialexportimport

UNITS - Vapor Recovery:

Novelles Applications Technologiques

UNITS - Well Acidizing & Fracturing:

Flopetrol
Industrialexport

UNITS - Well Cementing:

Industrialexportimport

UNITS - Well Servicing:

Industrialexport
Salzgitter Maschinen
Flopetrol
Vereinigte Edelstahlwerke

UNITS - Wireline:

ASEP BV Holland
Offshore Drilling Supplies, Ltd.
Tesel Services Ltd.
Flopetrol

VALVES:

Argus Gesellschaft M.B.H.
Borsig GmbH
Borsig Hartmann Valve Ltd.
Breda Fucine SpA
Brdr Christensens Haner A/S
BSL Bignier Schmid-Laurent
COMETNA, Companhia Metalurgica Nacional S.A.R.L.
Robert Cort & Son Ltd.
Daisho Valve Industry Co., Ltd.
Deer Park Engineering Pty. Ltd.
Deutsche Audco GmbH
Dewrance MacNeill & Company, Ltd.
Dip.-Ing. Werner Hartmann KG
EFACEC - Empresa Fabril de Maquinal Electricas
FAVRA, S.A.I.C.
FIP, S.A. de C.V.
Galli & Cassina S.R.L.
Grondona, S.p.A.
Grove Italia S.p.A.
Haruta Valve Mfg. Co., Ltd.
Herman von Rautenkranz Internationale Tiefbohr BmbH & Co., KG ITAG
Hirata Valve Industry, Ltd.
Hisaka Works, Ltd.,
Hitachi Metals, Ltd.
Hubner-Gray Machinen-und AG M.B.H.
IBRAVE-Industrias Brasileiras de Valvulas e Equipamentos Ltda.
IMS-Industria Metalurgica de Salvador S.A.
Ishida Valve Mfg. Co., Ltd.
Izumi Seisakusho Co., Ltd.
Japan Steel Works Ltd.
Jinn Lung Motor Co., Ltd.
John Valves Division Wornald International
Keystone Cannon Ltd.
K.K. Itabashi Kikai Seisakusho
Kinka Kikai Co., Ltd.
Kitamura Valve Mfg. Co., Ltd.
Kitazawa Valve Company Ltd.
Kobe Steel, Ltd.
Kubota, Ltd.
Malbranque Serseg Valve Pressure Vessel Department
Mannesmann Demag Meer
MAPEGAZ S.A.
Marwin Limited

VALVES (Contd.)

Mecafrance S.A.
Merex Argentina S.A.
Metalghisi
Mitsumoto Valve Mfg. Co., Ltd.
Munro & Miller Fittings Ltd.
Nakamura Metallic Industry Co., Ltd.
New Zealand Valve Company Ltd.
Nihon Koso Industry Co., Ltd.
Nippon Ball Valve Co., Ltd.
Nippon Chuzo Kabushiki Kaisha
Nippon Daiya Valve Co., Ltd.
Nippon Kokan Kabushiki Kaisha
Nippon Valqua Industries, Ltd.
Nuovo Pignone, S.p.A.
Okano Valve Mfg. Co., Ltd.
O.N. Industries Ltd.
ORION Officine Meccaniche Specializzate S.p.A
Osaka Valve Co., Ltd.
Pan-Korea Metal Industrial Co., Ltd.
PERAR S.p.A.
Petrovalves S.r.l.
RAIMONDI S.p.A.
B.C. Richards & Co. Pty. Ltd.
SAAB-SCANIA AB
Sella, S.p.A.
Serck Audco Pty., Ltd.
Serck Audco Valves
Shikoku Metal Industries Co., Ltd.
Showa Valve Co., Ltd.
Societe Nouvelle du Saut du Tarn
Stream-Flo Industries Ltd.
TA-Esco A/S
Takamisawa Koki Mfg. Co., Ltd.
TFW Techniflow s.p.a.
Thevignot S.A., Ets
Thomassen Amsterdan b.v.
T.K. Valve Limited
Tormene s.n.c.
Toyo Valve Co. Ltd.
Triangle Valve Co. Ltd.
Universal de Valvulas, S.A.
Utsue Valve Co., Ltd.
VAG-Armaturen GmbH
Valfisa, S.A.
VALVOSIDER s.r.l.
Valvulas Belg de Mexico, S.A.
Valvulas y Conexiones, S.A.
Vannes Darling France Sarl
Wakai Valve Mfg. Co., Ltd.
Walthon Weir Pacific, S.A.
Wilh. Bitter, Armaturenfabrik
Yoneda Kogyo Co., Ltd.
Yoneki Valve Co., Ltd.
Zimmerman & Jansen G.m.b.H.

VALVES - Air:
Atlas Copco AB
Kurt Kohorn Ltd.
Lanzagorta/Panaval
Lanzagorta/F M C A
New-Mar Oil Services Ltd.
Okgt
Serck Audco Valves

VALVES - Angle:

Brisco Engineering Ltd.
Costruzioni Hydro-Pneumatic
GEC Elliott Control Valves Ltd.
Kurt Kohorn Ltd.
Lanzagorta/Magnaval
Lanzagorta/F M C A
Rotator Norway

VALVES - Automatic Shut-off:

France Operator
Kurt Kohorn Ltd.
Serck Audco Valves

VALVES - Back Pressure:

Breda Fucine
Canada Works
Industrialexportimport
Kurt Kohorn Ltd.

VALVES - Balanced Stem:

Breda Fucine
Kurt Kohorn Ltd.
Lanzagorta/FIP

### VALVES - Ball:

- Barber Industries, Ltd.
- Breda Fucine
- Brisco Engineering, Ltd.
- GEC-Elliott Control Valves, Ltd.
- Goes International Petroleum Eng.
- Itag Celle
- Kurt Kohorn, Ltd.
- Lanzagorta/FMCA
- Mapegaz
- Offshore Drilling Supplies, Ltd.
- Okgt
- Phoceenne De Metallurgie
- Saut-Du-Tarn
- Sarck Audco Valves
- T. I. Group
- Trouvay & Cauvin

### VALVES - Ball Check:

- Breda Fucine
- Brisco Engineering, Ltd.
- Kurt Kohorn, Ltd.
- Lanzagorta/FMCA
- Mapegaz
- Saut-Du-Tarn

### VALVES - Block & Bleed:

- Breda Fucine
- Kurt Kohorn, Ltd.
- Lanzagorta/FIP
- Mapegaz
- Saut-Du-Tarn
- Serck Audco Valves

### VALVES - Bottom Hole Chemical:

- Kurt Kohorn, Ltd.
- Serck Audco Valves

### VALVES - Brass:

- Kurt Kohorn, Ltd.
- Serck Audco Valves
- T. I. Group

### VALVES - Butterfly:

- CBV
- Equipement Petrolier
- GEC-Elliott Control Valves, Ltd.
- Kurt Kohorn, Ltd.
- Lanzagorta/FMCA
- Lanzagorta/Magnaval
- Mento A/S

### VALVES - Butterfly (contd.)

- Niigata Engineering Co.
- Offshore Drilling Supplies, Ltd.
- Rognon S.A.
- Rotator Norway
- Serck Audco Valves
- T. I. Group
- Trouvay & Cauvin
- Vitro, S.A.

### VALVES - By-Pass:

- Kurt Kohorn, Ltd.
- Lanzagorta/FMCA
- Serck Audco Valves
- T. I. Group

### VALVES - Cage:

- Kurt Kohorn, Ltd.
- Mapegaz

### VALVES - Casing Annulus:

- Hubner Gray GmbH
- Kurt Kohorn, Ltd.

### VALVES - Casing Fill-up:

- Kurt Kohorn, Ltd.

### VALVES - Casing Float:

- Kurt Kohorn, Ltd.

### VALVES - Check:

- Breda Fucine
- Brisco Engineering, Ltd.
- Costruzioni-Hydro Pheumatic
- Kurt Kohorn, Ltd.
- Lanzagorta/FMCA
- Lanzagorta/Magnaval
- Lanzagorta/Panaval
- Mapegas
- Offshore Drilling Supplies, Ltd.
- T. I. Group
- Trouvay & Cauvin

### VALVES - Check, Wafer:

- Brisco Engineering, Ltd.
- Kurt Kohorn, Ltd.

VALVES - Chemical Injector:

Carlo, S.A

VALVES - Choke:

Hubner Gray GmbH
Lanzagorta International

VALVES - Christman Tree:

Breda Fucine
CBV
Hubner Gray GmbH
Kurt Kohorn, Ltd.
Lanzagorta/FIP
Malbranque
Mapegaz
Okgt

VALVES - Circulating:

Kurt Kohorn, Ltd.
Okgt
Serck Audco Valves

VALVES - Control:

Brastech Industrials
Costruzioni Hydro-Pneumatic
GEC-Elliott Control Valves, Ltd.
Kurt Kohorn, Ltd.
Mapegaz
Matra Offshore
Ohemco
Rotator Norway
Serck Audco Valves

VALVES - Cryogenic:

Mapegaz

VALVES - Diaphragm Operated:

Afeco, Inc.
GEC-Elliott Control Valves, Ltd.
Kurt Kohorn, Ltd.
Phoceenne De Metallurgie
Trouvay & Cauvin

VALVES - Disc:

Kurt Kohorn, Ltd.
Lanzagorta/FMCA
T. I. Group

VALVES - Discharge:

Bronzavia
Kurt Kohorn, Ltd.
Matra Offshore
Serck Audco Valves

VALVES - Drilling:

Breda Fucine
Griffith Oil Tool, Ltd.
Kurt Kohorn, Ltd.
Offshore Drilling Supplies, Ltd.
Omsco Ind., Inc.

VALVES - Dual:

Breda Fucine
Kurt Kohorn, Ltd.
Lanzagorta/FIP

VALVES - Dump:

Dreco, Ltd.
Costruzioni Hydro-Pneumatic
Kurt Kohorn, Ltd.

VALVES - Equalizing:

Kurt Kohorn, Ltd.

VALVES - Fail Safe:

Breda Fucine
Costruzioni Hydro-Pneumatic
Kurt Kohorn, Ltd.
Mapegaz
Saut-Du-Tarn
Serck Audco Valves

VALVES - Fail Safe, Subsea:

Kurt Kohorn, Ltd.
Mapegaz
Saut-Du-Tarn

VALVES - Float:

Breda Fucine
Kurt Kohorn, Ltd.
Serck Audco Valves

VALVES - Flow Control:

CBV
Equipement Petrolier

### VALVES - Flow Control (contd.)

GEC-Elliott Control Valves, Ltd.
Kurt Kohorn, Ltd.
Lanzagorta/FIP
Lanzagorta/FMCA
Niigata Engineering Co.
Vitro, S.A.

### VALVES - Formation Testing:

Kurt Kohorn, Ltd.

### VALVES - Four Way:

Mapegaz
Serck Audco Valves

### VALVES - Fracturing:

Brastech Industrials
Camlow
Kurt Kohorn, Ltd.

### VALVES - Gas Lift:

Afeco, Inc.
Bompet de Venuzuela
Carlo, S.A.
Impamex, S.A.
Saut-Du-Tarn

### VALVES - Gas Lift Packoff Assembly:

Afeco, Inc.
Teledyne Merla

### VALVES - Gas Lift, Pumpdown:

Afeco, Inc.

### VALVES - Gate:

Adamson & Hatchett
Breda Fucine
Brisco Engineering, Ltd.
Goes International Petroleum Services Pte., Ltd.
Kurt Kohorn, Ltd.
Lanzagorta/FIP
Lanzagorta/FMCA
Lanzagorta/Magnaval
Lanzagorta/Panaval
Malbranque
Offshore Drilling Supplies, Ltd.
Phoceenne De Metallurgie
A/S Raufoss, Ltd.

### VALVES - Gate (contd.)

Sereg/Schlumberger/Malbranque
T. I. Group
Trouvay & Cauvin
Unitor Ships Service AS

### VALVES - Gauge:

Brisco Engineering, Ltd.
Kurt Kohorn, Ltd.
Lanzagorta/FMCA
Serck Audco Valves

### VALVES - Globe:

Breda Fucine
Brisco Engineering, Ltd.
Kurt Kohorn, Ltd.
Lanzagorta/FMCA
Lanzagorta/Magnaval
Lanzagorta/Panaval
Mapegaz
Phoceenne De Metallurgie
Rotator Norway
Sereg/Schlumberger/Malbranque
T. I. Group
Trouvay & Cauvin

### VALVES - High Pressure:

Adamson & Hatchett
Breda Fucine
Brisco Engineering, Ltd.
Bronzavia
Costruzioni Hydro-Pneumatic
GEC-Elliott Control Valves, Ltd.
Kurt Kohorn, Ltd.
Lanzagorta/FIP
Lanzagorta/FMCA
Mapegaz
Offshore Drilling Supplies, Ltd.
Okgt
R O P
Saut-Du-Tarn
Serck Audco Valves
Sereg/Schlumberger/Malbranque

### VALVES - High Temperature:

Breda Fucine
Brisco Engineering, Ltd.
Kurt Kohorn, Ltd.
Lanzagorta/FIP
Lanzagorta/FMCA
Novelles Applications Technologiques
Okgt

### VALVES - High Temperature (contd.)

Saut-Du-Tarn
Serck Audco Valves
Sereg/Schlumberger/Malbranque

### VALVES - Hydraulic Retrievable:

Itag Celle
Hydraudyne B.V.
Kurt Kohorn, Ltd.

### VALVES - Hydraulically Operated:

Adamson & Hatchett
Breda Fucine
Brisco Engineering, Ltd.
Bronzavia
Dowty Offshore, Ltd.
Hydraudyne B.V.
Kurt Kohorn, Ltd.
Mapegaz
Matra Offshore
Rotator Norway
Saut-Du-Tarn
Serck Audco Valves

### VALVES - Insert:

Kurt Kohorn, Ltd.
Stabylia

### VALVES - Kelly, Joint Safety:

Griffith Oil Tool, Ltd.
Itag
Kurt Kohorn, Ltd.

### VALVES - LPG:

Kurt Kohorn, Ltd.
Lanzagorta/FIP
Novelles Applications Technologiques
Saut-Du-Tarn
Serck Audco Valves

### VALVES - Line Blind:

Kurt Kohorn, Ltd.

### VALVES - Liquid Sampler:

Barber Industries, Ltd.
Kurt Kohorn, Ltd.

### VALVES - Manifold:

Breda Fucine
Bronzavia
Kurt Kohorn, Ltd.
Lanzagorta/FIP
Offshore Drilling Supplies, Ltd.
Saut-Du-Tarn
Serck Audco Valves
Unitor Ships Service AS

### VALVES - Mixing Fluid:

Kurt Kohorn, Ltd.

### VALVES - Motor:

Breda Fucine
Costruzioni Hydro-Pneumatic
Kurt Kohorn, Ltd.

### VALVES - Mud:

Barber Industries, Ltd.
Dreco, Ltd.
Kurt Kohorn, Ltd.
Offshore Drilling Supplies, Ltd.
Serck Audco Valves

### VALVES - Mud Relief:

Kurt Kohorn, Ltd.

### VALVES - Mud Saver:

Griffith Oil Tool, Ltd.

### VALVES - Mud Suction:

Dreco, Ltd.

### VALVES - Mud Throttling:

Kurt Kohorn, Ltd.

### VALVES - Multiport:

Breda Fucine
Brisco Engineering
Kurt Kohorn, Ltd.
Lanzagorta International
Serck Audco Valves

### VALVES - Needle:

Breda Fucine
Brisco Engineering, Ltd.

### VALVES - Needle (contd.)

Kurt Kohorn, Ltd.
Lanzagorta/FMCA
Offshore Drilling Supplies, Ltd.
T. I. Group

### VALVES - Non-Lubricated Plug:

Breda Fucine
Kurt Kohorn, Ltd.
Lanzagorta International, Inc.
Mapegaz
Serck Audco Valves
T. I. Group

### VALVES - Orifice:

Breda Fucine
Kurt Kohorn, Ltd.

### VALVES - Pig Injector:

Brisco Engineering, Ltd.
Itag Celle
Kurt Kohorn, Ltd.
Serck Audco Valves

### VALVES - Piston Check:

Brisco Engineering, Ltd.
Bronzavia
Kurt Kohorn, Ltd.
Lanzagorta/FMCA

### VALVES - Plug:

Breda Fucine
Goes International Petroleum Services Pte., Ltd.
Industrialexportimport
Kurt Kohorn, Ltd.
Lanzagorta/Inval
Mapegaz
Offshore Drilling Supplies, Ltd.
Phoceenne De Metallurgie
Serck Audco Valves
T. I. Group
Trouvay & Cauvin

### VALVES - Pneumatically Operated:

Afeco, Inc.
Breda Fucine
Brisco Engineering, Ltd.
Costruzioni Hydro-Pneumatic
Itag Celle

### VALVES - Pneumatically Operated (contd.)

Mapegaz
Saut-Du-Tarn
Serck Audco Valves
Sigma Chemie, Ltd.

### VALVES - Pressure Control:

Barber Industries, Ltd.
Brisco Engineering, Ltd.
Bronzavia
Costruzioni Hydro-Pneumatic
GEC-Elliott Control Valves, Ltd.
Kurt Kohorn
Lanzagorta International, Inc.
Matra Offshore
Serck Augco Valves

### VALVES - Production:

Wenlen S.A.

### VALVES - Pump:

Industrialexportimport
Kurt Kohorn, Ltd.
Mapegaz
Offshore Drilling Supplies, Ltd.
Serck Audco Valves
Vereinigte Edelstahlwerke AG

### VALVES - Regulator:

Afeco, Inc.

### VALVES - Relief:

Brisco Engineering, Ltd.
Costruzioni Hydro-Pneumatic
GEC-Elliott Control Valves, Ltd.
Hydraudyne BV Holland
Kurt Kohorn, Ltd.
Lanzagorta/FMCA
Mapegaz
T. I. Group

### VALVES - Safety:

AVA International, Inc.
Costruzioni Hydro-Pneumatic
Flopetrol
GEC-Elliott Control Valves, Ltd.
Goldhan Olfeddaurustungen
Kurt Kohorn, Ltd.
Lanzagorta/FMCA
Phoceenne De Metallurgie
Saut-Du-Tarn
Site Oil Tools, Ltd.

VALVES - Self-Closing:

Kurt Kohorn, Ltd.
Mapegaz

VALVES - Self-Sealing:

Kurt Kohorn, Ltd.
Saut-Du-Tarn

VALVES - Shuttle:

Brisco Engineering, Ltd.
Kurt Kohorn, Ltd.

VALVES - Sphere Launching & Receiving:

Itag Celle
Mapegaz
Serck Audco Valves

VALVES - Standpipe:

Okgt
Serck Audco Valves

VALVES - Steam:

Breda Fucine
GEC-Elliott Control Valves, Ltd.
Kurt Kohorn, Ltd.
Lanzagorta/FMCA
Lanzagorta/Magnaval
Lanzagorta/Panaval
Okgt
T. I. Group

VALVES - Subsea:

Kurt Kohorn, Ltd.
Mapegaz
Saut-Du-Tarn

VALVES - Swing Check:

Brisco Engineering, Ltd.
Kurt Kohorn, Ltd.
Lanzagorta/FMCA
Lanzagorta/Magnaval
Lanzagorta/Panaval
Mapegaz

VALVES - Thermal Steam:

Breda Fucine

VALVES - Thermal System:

Kurt Kohorn, Ltd.

VALVES - Three Way:

Brisco Engineering, Ltd.
Itag Celle
Kurt Kohorn, Ltd.
Lanzagorta/FMCA
Mapegaz
Saut-Du-Tarn
Serck Audco Valves

VALVES - Timing:

Kurt Kohorn, Ltd.

VALVES - Triple String:

Kurt Kohorn, Ltd.
Lanzagorta/FIP

VALVES - Tubing:

Griffith Oil Tool, Ltd.
Kurt Kohorn, Ltd.
Sandvid AB

VALVES - Tbg. Safety, Pumpdown:

Kurt Kohorn, Ltd.

VALVES - Vacuum:

Kurt Kohorn, Ltd.
Serck Audco Valves

VALVES - Venturi Type:

Breda Fucine
Kurt Kohorn, Ltd.
Lanzagorta/Inval
Mapegaz
Saut-Du-Tarn
Serck Audco Valves
Sereg/Schlumberger/Malbranque

VALVES - Waterflood:

Carlo, S.A

VALVES - Wireline:

Kurt Kohorn, Ltd.

**VAPORIZERS** - Propane:

C. Goldhan
Novelles Applications Technologiques

**VEHICLES** - Underwater:

Comex Industries
Comex Seal
Ethyd

**VESSELS** - Pressure:

Creusot-Loire/Pressure Vessels Div.
Motherwell Bridge Group
Novelles Applications Technologiques
Otek Petroleum Products
Porta-Test Mfg., Ltd.
Rotator Norway

**VIBRATORS** - Hydraulic:

Hydraudyne B.V.

**VISCOSIMETERS:**

Anchor Drilling Fluids A/S
R O P
Samega

**VISCOMETERS** - Recording:

Anchor Drilling Fluids AS

**VISES** - Hydraulic:

Hydraudyne B.V.

**VISES** - Wire Rope:

United Ropeworks

**WALKWAYS** - Steel:

Bharat Heavy Electricals, Ltd.
Norseman Shelter, Ltd.
T. I. Group

**WALKWAYS** - Aluminum:

Verhoef Aluminum Scheepsbouwindustrie

**WASHERS** - High Pressure:

Unitor Ships Service AS

**WASHPIPE** - Swivel:

Arbarthorpe Oilfield Service, Ltd.
Equipetrol SA
Industrialexportimport

**WELDING** - Subsea:

Lockheed Petroleum Services, Ltd.
Nippon Kokan K.K.
Unitor Ships Service

**WELL CEMENT:**

Blue Circle Industries, Ltd.
Canada Cement Lafarge Limited
Cementos Apasco, S.A.
Cementos Hercules
Cimento Aratu S.A.
Compagnie des Ciments Belges
Companhia De Cimento Protland Alvorada
Dyckerhoff Zementwerke AG
Jalaprathan Cement Co., Ltd.
La Cemento Nacional C.E.M.
Lafarge
Nihon Cement Co., Ltd.
A/S Norcem
Pan Malaysia Cement Works (Singapore) Pte., Ltd.
Societe Des Ciments Libanais
Sumitomo Cement Co., Ltd.
Tehran Cement Co., Ltd.
Trinidad Cement, Ltd.
Ube Industries, Ltd.

**WELLHEAD** - Equipment;

Barber Industries
B.D. Specials, Ltd.
Bonney Forge International, Ltd.
Breda Fucine S.p.A.
John Brereton Flange Div., Doncasters Moorside Limited
Bruck GmbH Rofrverbindungen
Burton, Delingpole & Company, Ltd.
"Canada" Tiefbohrgerate-und Maschinenfabrik
CBV Industria Mecanica, S.A.
Celler Maschinenfabrik Gebruder Schafer
Corrugated Packing & Sheet Metal Co., Ltd.
Danco Talleres Metalurgicos S.R.L.
Energoinvest
Ets. WILRAY S.P.R.L.
FIP, S.A. de C.V.
Flextallic Gaskets, Lrd.
Flotec Group, Ltd.
Forjas de Colombia S.A.
Futawa Flange Works Co., Ltd.
Galaxy Machine & Mfg. Co., Ltd.

WELLHEAD - Equipment (contd.)

Galaxy Oilfield Service, Ltd.
Gilardina S.p.A.-Division R I F
Hirata Valve Industry Co., Ltd.
Hofland Pakking B.V.
Hubner Vamag AG & Co. KG
John Valves Division, Wornald Int'l.
K.K. Itabashi Kikai Seisakusho
Kanda Sangyo Co., Ltd.
Kampchen & Co., GmbH
Kent Machine & Mfg., Ltd.
LANZA S.p.A.
Linvic Engineering, Ltd.
Mannesmann Denmag Meer
Mardale Engineering Co., Ltd.
James MdLarty & Son
Metal Forgings Private Limited
Moorside Machining Co., Ltd.
Munro & Miller Fittings, Ltd.
Nicola Galperti & Figlio
ORION Officine Meccaniche Specializzate
Perolo S.A.
Rector-Gray, Ltd.
Robinson Piping Productd, Ltd.
Serck Audco Valves
Sereg/Schlumberger/Malbranque
Societe Pyreneenne de Macanique
Stream-Flo Industries, Ltd.
Weldco, Ltd.
Welding Units (UK), Ltd.
Willis Oil Tool Canada, Ltd.
Woodhouse & Rixson Flanges Limited
Yahata Machine Manufacturing, Inc.

WELLHEADS - Geothermal:

Breda Fucine
CBV Industria Mecanica
Canada Works
Mapegaz
Wenlen S.A.

WINCHES - Air Operated:

Atlas Copco AB
Ceria
Industrialexportimport
Unitor Ships Service
Wharton Engineers

WINCHES - Anchor:

A.S. Bergens Makaniske Verk
Brissonneau & Lotz Marine
Ceria

WINCHES - Anchor (contd.)

Clarke Chapman, Ltd.
Hydraulik Brattvaag
Pusnes Makaniske Verksted
Wharton Engineers

WINCHES - Bailing:

Ceria

WINCHES - Drum:

A.S. Bergens Mekaniske Verk
Ceria
Clarke Chapman, Ltd.
GEC Mechanical Handling
Skagit Corp.
Wharton Engineers

WINCHES - Hydraulic:

ASEP BV Holland
A. S. Bergens Mekaniske Verk
Brissonneau & Lotz Marine
Ceria
Clarke Chapman, Ltd.
Dowty Offshore, Ltd.
Ethyd
Flopetrol
Freidrich Leutert GmbH & Co.
GEC Mechanical Handling
Hydraudyne BV
Hydraulik Brattvaag
Pusnes Mekaniske Verksted
Western Hydraulic
Wharton Engineers

WINCHES - Moorings:

A. S. Bergens Mekaniske Verk
Brissonneau & Lotz Marine
Ceria
Clarke Chapman, Ltd.
GEC Mechanical Handling
Skagit Corp.
Wharton Engineers

WINCHES - Self Propelled:

Flopetrol
Salzgitter Maschinen
Wharton Engineers

WINCHES - Skid:

ASEP BV Holland
Ceria
Clarke Chapman, Ltd.
Friedrich Leutert GmbH & Co.
Salzgitter Maschinen
Wharton Engineers

WINCHES - Subsea:

Ceria
Wharton Engineers

WINCHES - Testing:

Pusnes Makaniske Verksted
Wharton Engineers

WINCHES - Tractor, Truck:

ASEP BV Holland
Ceria
Itag
Wharton Engineers

WINCHES - Trailer:

Wharton Engineers

WINCHES - Utility:

Clarke Chapman, Ltd.
Wharton Engineers

WINCHES - Waterfall Type:

A. S. Bergens Mekaniske Verk
Clarke Chapman, Ltd.
Hydraulik Brattvaag
Skagit Corp.
Wharton Engineers

WINCHES - Wireline:

A.S. Bergens Mekaniske Verk
ASEP BV Holland
Atlas Copco
Ceria
Diamant Boart S.A.
Flopetrol
Friedrich Leutert GmbH & Co.
Pusnes Mekaniske Verksted
Western Hydraulic
Wharton Engineers

WINDBREAKS - Canvas:

Hendrik Veder
Norseman Shelters, Ltd.

WINDLASSE:

A. S. Bergens Mekaniske Verk
Brissonneau & Lotz Marine
Ceria
Clark Chapman, Ltd.
Skagit Corp.

WIPERS - Automatic Line:

Sigma Chemie, Ltd.

WIPERS - Key Seat:

Lion Oil Tool
Sigma Chemie, Ltd.

WIPERS - Pipe:

Arbarthorpe Oilfield Services, Ltd.
Goes International Petroleum Service Pte., Ltd.
Industrialexportimport
Mento A/S
Sigma Chemie, Ltd.
Stabylia

WIPERS - Rod & Tubing:

Sigma Chemie, Ltd.

WIPERS - Well Bore:

Sigma Chemie, Ltd.

WIPERS - Wireline:

Flopetrol
Sigma Chemie, Ltd.

WIRE - Electrical:

Goes International Petroleum Service Pte., Ltd.
Northern Rig Lites
Societa Cavi Pirelli

WIRE - Stabilized:

G K N Group

WIRELINE MEASURING:

ASEP BV Holland

### WIRELINE MEASURING - (contd.)

Creusot-Loire/Metallurgie
Pusnes Mekaniske Verksted
Tesel Services, Ltd.

### WIRELINE TOOLS:

Carlo, S.A.
Seaco
Superior Oil Service

### WIRE ROPE:

Acciaierie e Ferriere Lombarde Falck
Aceros Nacionales S.A.
Anglo-Continental Ropes S.A.
Trefil-Arbed, Vereinigte Drahtwerke,
  Arbed-Felton & Guilleaume S.A.
Australian Wire Industries Pty., Ltd.
Berjaya Kawat Berhad
Bertram, K.G., J.
Bombay Wire Ropes, Ltd.
British Ropes Ltd.
Bruntons (Musselburgh), Ltd., Wire Mills
Cableworks Brugg, Ltd.
Camesa, Sociedad Anonima
C.I.M.A.F.
Crawhall & Sons, Ltd.
Dawson & Usher, Ltd.
Den Haan Staalkabelfabriek N.V.
Deriver, S.p.A.
Drahtseilerie Gustav Kock GmbH
Drahtseilwerke Saar GmbH
Elkem-Spigerverket A/S, Stal Og Tau
Empresa Colombiana de Cables S.A.
Est, Metalurgicos Santa Rosa, S.A.
Fatzer AG Romanshorn
Felix Simon S.A.C.I.F.A.
Felten & Guilleaume AG
Firth Cleveland Ropes, Ltd.
Fort William Co., Ltd.
Frew Brothers & Company, Ltd.
Georg Heckel GmbH
Guiseppe & Fratello Redaelli Soc. p. Az.
Glover Borthers (Mossley), Ltd.
Greening Donald, Ltd.
Gunnebo Bruks Aktiebolag
Haggie Steel Ropes, Limited
Hall's Barton Ropery, Co., Ltd.
Heinr. Puth Kom. Ges.
Igeta Wire Rope Co., Ltd.
J.K. Steel & Industries, Ltd.
Kokoku Steel Wire, Ltd.
Korea Iron & Steel Works, Ltd.

### WIRE ROPE - (contd.)

Laminoirs Trefileries Cableries de Lens
Latch & Batchelor, Ltd.
Le Lis, Ltd.
Lesjofors Aktiebolag
Manoel Rodrigues D'Oliveira SA & Filhos, Lda.
Maroni Sebastiano S.p.A., Corderie Trafilerie
Martin, Black & Co. (Wire Ropes), Ltd.
Martin, Black Wire Ropes of Canada, Ltd.
Mohatta & Heckel, Ltd.
Nippon Steel Wire Rope Co., Ltd.
A/S Norsk Staaltaugfabrik
Productos de Acero S.A.
S.A. Des Hauts Fourneaux De La Chiers
Schweizerische Seil-Industrie AG
Scottish Wire Rope Co., Ltd.
Seilindustrie Ernst Seifuss
John Shaw, Limited
Shinko Wire Co., Ltd.
Sociedad Franco Espanola de Alambres, Cables
  y Transportes Aceros
Societe Des Trefileries De Chatilon - Gorcy
South India Wire Ropes, Limited
St. Egydyer Eisen-Und Stahl Industrie-
  Gesellschaft
Steel Rope Industries (N.Z.), Ltd.
Teikoku Sangyo Co., Ltd.
Teufelberger, K.
Thyssen Westfaelische Union AG
Tokyo Rope Mfg. Co., Ltd.
Trefilerie & Cablerie J. Wurth & Cie
Trenzas y Cables de Acero S.A.
United Ropeworks
United Wire Ropes, Ltd.
Usha Wire Ropes (Export Division)
Usines Gonzales Cock S.A.
Vereinigte Drahtseilwerke GmbH
Wireco Venezolana, C.A.
Wire Rope Industries, Ltd.
Wire Rope Industries, Ltd.
Wire Rope Works Messilot, Ltd.
Gustav Wolf
Wrights Canadian Ropes, Ltd.

### WORKSHOP - Service:

Creusot-Loire Energie Developements
Van Der Horst Asia Pte., Ltd.

### WRENCHES - Bean:

Canada

### WRENCHES - Impact:

Atlas Copco AB
Unitor Ships Service

WRENCHES - Pipe:

Unitor Ships Service AS

WRENCHES - Sucker Rod:

Industrialexportimport

WRENCHES - Torque:

Arbarthorpe Oilfield Services, Ltd.

# Non-U.S. Sources of Petroleum Equipment

## By Country of Origin

## ARGENTINA

ACINDAR, Industria Argentina de Aceros S.A.
AVAN S.A.I.C.
Bolland & Cia. S.A.
Camlow
Carlo, S.A.
Cometarsa S.A.I.C.
Dalmine Siderca S.A.I.C.
Danco Talleres
Diamont Bort of Argentina
Est. Mecanicos Jone S.A.I. y C.
Est. Metalurgicos Santa Rosa S.A.
FAVRA, S.A.I.C.
Felix Simon S.A.C.I.F.A.
Industrias Pirelli, S.A.I. y C.
Merex Argentine S.A.
Metalurgica Bellucci S.A.I.C.F.I.A.
Petromecanica S.A.I. y C.
Rusco Hnos S.A.
Siam Di Tella Ltda.
Tool Research
Wenlen, S.A.
Win-Lyn

## AUSTRALIA

Australian Wire Industries Pty., Ltd.
Deer Park Engineering Pty. Ltd.
John Valves Division Wornald International
James McLarty & Son
B. C. Richards & Co. Pty. Ltd.
Serck Audco Pty., Ltd.
Tubemakers of Australia Ltd.

## AUSTRIA

Canadawerk
Felten & Guilleaume AG
Huber-Gray Machinen-und AG M.B.H.
Hubner Vamag AG & Co. K.G.
Semperit Aktiengesellschaft
St. Egydyer Eisen-und Stahl Industrie-Gesellschaft
Teufelberger, K.
Tiefbahrgerate-und Muschinenfubrik
Vereinigte Edelstahlwerke AG
VOEST-ALPINE AG
Waagner-Biro Aktiengesellschaft

## BAHAMAS

Bruce International

## BELGIUM

ACEC (Ateliers de Constructions Electriques de Charlerio)
Anglo-Continental Ropes S.A.
Compagnie des Ciments Belges
Diamant Boart S.A.
LeLis Ltd.
Usines a Tubes de la Meuse
Usines Gonzales Cock S.A.

## BRAZIL

Brastech Industrials
CBV Industrial
CBV Industria Mecanica S.A.
CBV Equipetrol
C.I.M.A.F.
Companhia Di Gmento Portland Alvorade
Confab Industrial S.A.
Danco Tolleres Metalurgicos S.R.I.
Equipetrol S.A.
IBRAVE - Industrias Brasile iras de Valvulas e Equipmentos Ltda.
IMS - Industria Metalurgica de Salvador S.A.
Mannesmann S/A
Persico Pizzamiglio S.A.

## CANADA

The Algoma Steel Corp., Ltd.
Argo Sales, Ltd.
Barber Industries
Blow Out Products, Ltd.
Borsig Hartmann Valve Ltd.
Canada Cement Lafarge, Ltd.
Canadian Crown Steel Tank Co., Ltd.
Canvil, Ltd.
Clemmer Industries Ltd.
Cougar Tool Division, OPI Ltd.
Dominion Bridge Company Limited
Dreco, Ltd.
Galaxy Machine & Mfg. Co. Ltd.
Galaxy Oilfield Service Ltd.
Greening Donald Ltd.
Griffith Oil Tool Ltd.
Hamilton Gear & Machine Co.
Interprovincial Steel & Pipe Corp., Ltd.
Kent Machine & Mfg. Ltd.
Knoll Rig & Equipment Manufacturing Co., Ltd.
LeGrand Industries, Inc.
Martin, Black Wire Ropes of Canada, Ltd.
Northern Rig Lites Ltd.
Phillips Driscopipe, Inc.
Phillips Extruded Products, Ltd.

## CANADA - (Continued)

Quinn's Oilfield Supply Ltd.
R & D Machine Ltd.
Recon Manufacturing Co.
Rector-Gray Ltd.
Reinhold Industries Ltd.
Renn Industries, Inc.
Robinson Piping Products Ltd.
Stelco Inc.
T.P.S. Industries Ltd.
Tri-Service Machine Ltd.
Universal Industries Ltd.
Wire Rope Industries, Ltd.
Wrights Canadian Ropes Ltd.

## CHILE

Productos de Acero S.A. (PRODINA)

## COLOMBIA

Empresa Colombiana de Cables S.A.

## CZECHOSLAVAKIA

Nova Hut Klementa Gottwalda, Narodni Podnik
Vitkovice Steel and Engineering Works of Klement Gottwald, Nat. Corp.

## DENMARK

Brdr. Christensen s Haner A/S
Roulands Fabriker, Ltd.

## FINLAND

Rauma Pepola Oy

FRANCE

ACB (Ateliers et Chantiers de Bretagne)
Alsthom Atlantique, Division Moteurs
Alsthom Atlantique, Neyrfor
BSL (Bignier Schmid-Laurent)
Basset-Bretagne-Loire
Brissonneau & Lotz Marine
Bronzavia
CGE Group
CIT Alcatel
Ceca S.A.
Ceria
Colmant Cuvelier
Coflexip
Comex Group
Creusot-Loire Group
EMH (Equipements Mecaniques et Hydrauliques)
Engrenages et Reducteurs
Equipment Petrolier
Ethyd
Flopetrol
Geomecanique
Graffenstaden Division
Hercules France S.A.
Jeumont-Schneider
Kleber-Colombes
Lafarge
Laminoirs Trefileries Cableries de Lens
Malbranque Serseg Valve Pressure Vessel
Mapegaz S.A.
Marep Division
Matra Offshore
Mecafrance S.A.
Merip
Micro-Mecanique Pyreneene
N.A.T. (Novelles Applications Technologiques)
Perolo S.A.
Petromeca
ROP s.a.
S.A. Des Hauts Fourneaux De La Chiers
SMF Creusot-Loire
SMF International
Sacm
Samega
Saut Du Tarn
Sedis
Sereg Schlumberger
Societe Des Trefileries De Chatilon - Gorcy
Societe Nouvelle du Saut du Tarn
Societe Pyreneenne de Mecanique
Sofresid
Stabylia
Thevignot S.A., Ets
Thomson-CSF AVS
Thomson-CSF Dasm
Trefilerie & Cablerie J. Wurth & Cie.

FRANCE - (Continued)

U.M.D. International
Union Industrielle et D'Entreprise
Usinor
Valexy Vallourec
VALTI
Vannes Darling France Sarl

W. GERMANY

Amsted-Siemag Kette GmbH
Arbed-Felten & Guilleaume S.A.
Argus Gesellschaft M.B.H.
Arntz-Optibelt-KG
Bergrohr GMBH
J. Bertram, K.G.
Blohm & Voss AG
Borsig GmbH
Bruck GmbH Rohrverbindungen
Celle Maschinafabriken
Celler Maschinenfabrik Gebruder Schafer
Deutsche Audco GmbH
Dipl.-Ing. Werner Hartmann KG
Drahtseilerei Gustav Kocks GmbH
Drahtseilwerke Saar G.m.b.H.
Dyckerhoff Zementwerke A.G.
Eisenwerk - Gesellschaft Macimillanshutte mbH
Eschweiler Bergwerks-Verein AG
Estel Rohr AG
GHH Sterkrade AG
C. Goldhan-Olfeldausrustungen G.M.B.H.
Georg Heckel G.m.b.H.
Heinr. Puth Kom. Ges.
Hermann von Rautenkranz, Internationale Tiefbohr GmbH & Co. KG, ITAG
Hoesch Roehrenwerke AG
Hoechst AG
Itag, celle
Kempchen & Co., G.m.b.H.
Klippon Electricals Ltd.
Kloeckner-Humboldt-Deutz AG
Kolsch-Folzer-Werke AG
Leotert
Friedrich Luetert GmbH & Co.
Mannesmann Demag Meer
Mannesmannrohren-Werke AG
Moller-Werke GMBH
Paderwerk Gebr. Benteler
Peter-BTR, Gummiwerke AG
Rohrenwerke Bous/Saar GmbH
Sachtleben Chemie GmbH
Salzgitter Maschinen Und Anlagen AG
Seilindustrie Ernst Deifuss
Thyssen Wetfaelische Union AG
VAG-Armaturen GmbH

W. GERMANY - (Continued)

Vereinigte Drahtseilwerke GmbH
Weidmuller K.G.
Wilh. Bitter, Armaturenfabrik
Alfred Wirth & Company KG
Wirth Maschinen-Und Bohrgerate Fabrik GmbH
Gustav Wolf
Zimmerman & Jansen G.m.b.H.

## GREECE

Athens Pipe Works S.A.
Corinth Pipeworks

## HOLLAND

Chemische Fabriek Servo B.V.
De Vries Robbe & Co., N.V.
Den Haan Staalkabelfabriek N.V.
Hendrik Veder B.B.
Hofland Pakking b.v.
Holec
RSV
Rademakers Aandrijvingen B.V.
Scholten
W.A. Scholten's Chemische Fabrieken b.v.
Thomassen Holland B.V.
United Ropeworks

## HUNGARY

Csepel Works

## INDIA

Bharat Heavy Electricals Ltd.
Bombay Wire Ropes Ltd.
Dewrance MacNeil & Company, Ltd.
The Fort William C., Ltd.
The Indian Tube Co., Ltd.
J. K. Steel & Industries, Ltd.
Laxmi Udyog
Metal Forgings Private Limited
Mohatta & Heckel Ltd.
South India Wire Ropes Limited
United Wire Ropes, Ltd.
Usha Wire Ropes

## ITALY

Acciaierie e Ferriere Lombarde FALCK S.p.A.
Acciaierie Tubificio Arvedo
Alessio Tubi S.p.A.
Breda Fucine S.p.A.
Costruzioni Hydro-Pneumatic
Dalmine S.p.A.
Deriver, S.p.A.
Edemsarda SpA
F.I.T. Ferrotubi Corbetta S.p.A.
Galli & Cassina S.R.L.
Gilardina
Grondona, S.p.A.
Grove Italia SpA
Guiseppe & Fratello Redailli Soc. p. Az.
Industrie Pirelli S.p.A.
LANZA S.p.A.
Mario Maraldi S.p.A.
S.P.A. James Massarenti
Maroni Sebastiano S.p.A., Corderie Trafilerie
Metalghisi
Nicola Galperti & Figlio
Nuovo Pignone, SpA
ORION Officine Meccaniche Specializzate
PERAR S.p.A.
Petrolvalves S.r.L.
RAIMONDO S.p.A.
S.E.T.A., S.p.A., Societa Europea Tubifici e Acciaierie S.p.A.
Sella, S.p.A.
Tormene s.n.c.
TFW Techniflow s.p.a.
Tubificio Dalmine Italsider S.p.A.
Valvosider s.r.l.

## ISRAEL

Middle East Tube Co.
Wire Rope Works Messilot, Ltd.

## IRAN

Tehran Cement Co., Ltd.

## JAPAN

Arai Iron Works Co., Ltd.
Awaji Sangyo K.K.
Daido Seiko
Daido Steel Co., Ltd.
Dai-Ichi Sokuhan Works, Ltd.

JAPAN - (Continued)

Daisho Valve Industry Co., Ltd.
Dawaguchi Metal
Fuji Tekko K.K.
Fukuda Kogyo Co. Ltd.
Futawa Flange Works Co. Ltd.
Hamanaka Chain Mfg. Co., Ltd.
Haruta Valve Mfg. Co. Ltd.
Hirata Valve Industry, Ltd.
Hisaka Works, Ltd.
Hitachi Metals, Ltd.
IKS
Igeta Wire Rope Co., Ltd.
Ishida Vave Mfg. Co., Ltd.
Itoh
Izumi Seisakusho Co., Ltd.
Japan Mechanical Chain Mfg. Co., Ltd.
The Japan Steel Works Ltd.
K.K. Itabashi Kikai Seisakusho
Kanda Sangyo Co., Ltd.
Kashiwara Machine Manufacturing Co., Ltd.
Kawaguchi Kinsoki
Kawasaki Steel Corp.
Kimura Yasaku Co., Ltd.
Kitamura Valve Mfg. Co. Ltd.
Kinkakikai Co., Ltd.
Kitaziwa Valve Company Ltd.
Kobayashigen Sangyo Co. Ltd.
Kobe Steel, Ltd.
Koku Steel Wire, Ltd.
Kokubo Tekksho
Kubota, Ltd.
Kuroda Precision Industries, Ltd.
Maruichi Steel Tube Ltd.
Mitsubishi
Mitsubishi Heavy Industries
Mitsubishi Steel Mfg. Co. Ltd.
Mitsuboshi Belting Ltd.
Mitsumoto Valve Mfg. Co., Ltd.
Nakamura Metallic Industry Co., Ltd.
Nihon Cement Co., Ltd.
Nihon Kosg Industry Co., Ltd.
Niigata Engineering Company
Nippon Ball Valve Co. Ltd.
Nippon Chain & Anchor Co., Ltd.
Nippon Chuzo K.K.
Nippon Daiyo Valve Co., Ltd.
Nippon Kokan Kabushiki Kaisha
Nippon Kokan Tsugite Kabushiki Kaisha
Nippon Steel Corp.
Nippon Steel Wire Rope Co., Ltd.
Nippon Valqua Industries, Ltd.
Nishimura Koki Co., Ltd.
O.N. Industries, Ltd.
OSG Manufacturing Co.
Ohara Iron Works Co., Ltd.

JAPAN - (Continued)

Ohara Tekko
Okano Valve Mfg. Co. Ltd.
Osaka Tetsuen Kikai Co., Ltd.
Osaka Valve Co., Ltd.
Pulton Chain Co., Inc.
Sakai Iron Works Co., Ltd.
Sanyo Special Steel Company
SekiyuSakuseiki Seisaku K.K.
Shikoku Metal Industries Co., Ltd.
Shinko Wire Co., Ltd.
Showa Valve Co., Ltd.
Sumitomo Cement Co. Ltd.
Sumitomo Metal Industries, Ltd.
Tahara Manufacturing Co., Ltd.
Takamisawa Koki Mfg. Co. Ltd.
Tamotsu Kogyo Kabushiki Kaisha
Teikoku Sangyo Co., Ltd.
Toa Gaigyo Company. Ltd.
Togawa Rubber Mfg. Co., Ltd.
Tokiwa Industrial Co., Ltd.
Tokyo Buhin Kogyo Co., Ltd.
Tokyo Kinsoku Kogyo K.K.
Tokyo Rope Mfg. Co., Ltd.
Tokyo Sokuhan Co., Ltd.
Tone Boring Co., Ltd.
Toshin Kogyo Co., Ltd.
Toyo Valve Co., Ltd.
The Tsubakimoto Chain Mfg. Co., Ltd.
Tsujikawa Mfg. Co. Ltd.
Tsukamoto Seiko Co., Ltd.
Utsue Valve Co., Ltd.
Wakai Valve Mfg. Co., Ltd.
Yahata Machine Mfg. Co., Ltd.
Yoneda Kogyo Co., Ltd.
Yoneki Valve Co., Ltd.
Yoshida Boring Machine Manufacturing Co., Ltd.

KOREA

Hyundai Pipe Co., Ltd.
Ilssin Steel Co., Ltd.
Korea Iron & Steel Works, Ltd.
Korea Steel Pipe Co., Ltd.
Pan-Korea Metal Industrial Co., Ltd.
Pusan Steel Pipe Industrial Co., Ltd.
Union Steel Mfg. Co., Ltd.

W. MALAYSIA

Berjaya Kawat Berhad

## MEXICO

Aceros Nacionales S.A.
Barrenas de Mexico, S.A.
Camesa, Sociedad Anonima
Cementos Apasco, S.A.
Conjunto Manufacturero S.A. de C.V.
Emca, S.S. de C.V.
Empresas Lanzagorta
FIP, S.A. de C.V.
HYLSA, S.A.
Industrial de valvulas, S.A. de C.V.
Inpamex S.A.
Lanzagorta
Magnaval, S.A. de C.V.
Manufacturas Y Servicios Industriales, S.A.
Panamericana de valvulas S.A. de C.V.
Productos Tubulares Monclova, S.A.
Swecomex, S.A.
T.F. De Mexico, S.A.
Tubacero, S.A.
Tubos de Acero de Mexico, S.A.
Universal de valvulas, S.A.
Valvulas Belg de Mexico, S.A.
Valvulas y Conexiones, S.A.
Vitro, S.A.

## NEW ZEALAND

The New Zealand Valve Company Ltd.
Steel Rope Industries Ltd.

## NORWAY

Aker Norsco Contracting A/S
A.S. Bergens Medkaniske Verkstader
Elektro Union Offshore A/S
Elkem-Spigerverket a/s, Stal Og Tau
Gummi A/S K. Lund & Co.
A/S Hydraulik Brattvaag
Irgens Larsen A.S.
Kurt Kohorn Ltd. A/S
Donnesberg
Moelven Brug
A/S Norcem
A/S. Normar
Norsk Hydro
A/S Norsk Staaltaugfabrik
North Sea Exploration Services A/S
Nylands Verksted
Pusnes Medkaniske Verksted A.S.
Rotator Norway a.s.
TA-Esco A/S
Unitor Ships Services A/S

## PORTUGAL

COMETNA, Companhia Metalurgica Nacional S.A.R.L.
Manoel Rodrigues D'Oliveira SA & Filhos, Ltda.

## ROMANIA

Industrialexport
Intreprinderea De Tevi Republica
Intreprinderea De Tevi Roman
Intreprinderea De Utilaj Petrolier
Intreprinderea Mecanica Fina
Intreprinderea "1 Mai"
Intreprinderea Vulcan Bucuresti

## SINGAPORE

Avery-Laurence Equipment Pte. Ltd.
Oilfield Mfg. Pte., Ltd.
Oilfield Tubular Services (s) Pte. Ltd.
Van Der Horst Asia Pte. Ltd.

## SOUTH AFRICA

Haggie Steel Ropes Limited

## SPAIN

Dragados Y Construcciones, S.A.
Laminaciones de Lesacu, S.A.
Sociedad Franco Espanola de Alambres, Cabler y Transportes Aceros
Transformaciones Metalurgicas Especiales, S.A.
Trenzas y Cables de Acero S.A.
Trinidad Cement, Ltd.
Tubacex, C.E. de Tubos por Extrusion, S.A.
Tubos Reunidos, S.A.
Walthon Weir Pacific, S.A.
Valfisa, S.A.
Vininay, S.A.

## SWEDEN

AB Bofors-Nohab
Atlas Copco AB
Bulten-Kanthal AB
Gunnebo Bruks Aktiebolag
Lesjofors Aktiebolag

### SWEDEN -(Continued)

Ljusne (LW) Chain
SKF Steel
SAAB-SCANIA AB
Sandvik AB
Uddeholms Atkiebolag

### SWITZERLAND

Cableworks Brugg Ltd.
Fatzer AG Romanshorn
Industrial & Mining Bit Manufacturing
Schweizerische Seil-Industrie A.G.

### TAIWAN

CTCI Corp.
The Far East Machinery Co., Ltd.
Jinn Lung Motor Co., Ltd.

### UNITED KINGDOM

Adamson & Hatchett Ltd.
Ansell, Jones & Co., Ltd.
Armstrong Whitworth Ltd.
Automatic Oil Tools Systems Ltd.
Automotive Products Limited
B.D. Specials Ltd.
BLK Alloys Ltd.
BKL Fittings Ltd.
Blue Circle Industries, Ltd.
Bonney Forge Int'l Ltd.
Bradley Laminates Ltd.
John Breteton & Co., Ltd.
John Brerton Flange Div., Doncaster-Moorside Ltd.
Brisco Controls
British Ropes, Ltd.
British Steel Corp.
British Steel Tube Co. Ltd.
Bruntons Ltd.
Burton, Delingpole & Co., Ltd.
J. Caslake Ltd.
Clarke Chapman Ltd.
Compoflex, Ltd.
Corrugated Packing & Sheet Metal Co., Ltd.
Robert Cort & Son Ltd.
Coventry Gauge, Ltd.
Joseph Crawhall & Sons Ltd.
Dawson & Usher, Ltd.
DEMCO Ltd.

## UNITED KINGDOM

Desford Tubes Ltd.
Doncaster Moorside Limited
Dorman Diesels Ltd.
Dowty Offshore Limited
Drillcon Industries Ltd.
Euro-Drill Equipment Ltd.
James Fairley Steels
J. H. Fenner & Co., Ltd.
Ferranit Offshore Systems Ltd.
Firth Cleveland Ropes Ltd.
Flextallic Gaskets Ltd.
Flotec Group Ltd.
Frew Brothers & Company, Limited
GKN Group
Glover Brothers, Ltd.
Greengate Industrial Polymers Ltd.
Griflex Products Ltd.
Barton Hall's Ropery Co. Ltd.
Hamblin & Glover Oilfield Services Ltd.
Hamblin Oilfield (Services) Ltd.
Hawkins & Tipson Ltd.
Horstmann Gauge and Metrology Ltd.
Hullite Ltd.
Robert Jenkins Oil & Gas Ltd.
Keeton, Sons & Ltd.
Keyston Cannon Ltd.
Kingston Instrument Co., Ltd.
Latch & Batchelor Ltd.
Linvic Engineering Ltd.
Lion Oil Tool Group
Mardale Engineering Co. Ltd.
Martin, Black & Co. (Wire Ropes) Ltd.
Marwin Limited
Millingford Engineering Co., Ltd.
Moorside Machining Co. Ltd.
Motherwell Bridge Group
Munro & Miller Fittings Ltd.
Norbrit-Pickering Limited
O.I.S. (Oilfield Inspection Services)
Offshore Drilling Supplies Ltd.
The Oil Well Engineering Co., Ltd.
Paxman Diesels Ltd.
Pethow Ltd.
Phoenix Steel Tube Co. Ltd.
Plenty & Son Ltd.
Redpath Dorman Long Ltd.
Renoid Ltd.
Rollo-Hardy Ltd.
Round Oak Steel Works Ltd.
Ruston Diesels Ltd.
The Scottish Wire Rope Co. Ltd.
SEACO (B.P.S.)
Seamore Oil & Gas Processing Ltd.
Sea Oil Services Ltd.
Serck Audco Valves

## UNITED KINGDOM - (Continued)

Sigmund Pulsometer Pumps Ltd.
John Shaw Limited
J. K. Smit & Sons Diamond Tools, Ltd.
Stewart Ross & Company, Ltd.
Stow Engineering Company, Ltd.
TK Valve Limited
TI Coventry Gauge Ltd.
TI Offshore
C. H. Taylor & Co., Ltd.
Triangle Valve Co. Ltd.
Tru-Thread Ltd.
Tube Investments Ltd.
Uni-Tube Limited
The United Flexable Metallic Tubing Co., Ltd.
Weir Polypac Ltd.
Weldco Ltd.
Welding Units Ltd.
Whorton Engineers International Ltd.
Wichita Co., Ltd.
Frank Wigglesworth & Co., Ltd.
Wilson Ltd.
Woodhouse & Rixson Flanges Ltd.
Superior Oil Service

## VENEZUELA

Bompet de Venezuela
C.A. Conduven
C.V.G. Siderurgica del Orinoco C.A.
Empresas Mito Juan
Fabriuen De Venezuela
Formiconi C.A.
Industrias National Supply
Wireco Venezolana, C.A.

## YUGOSLAVIA

Energoinvest
Kisivska Metalna Industrija
NRGO Invest
Zeljezara Sisak

## Addendum to the Submission of the Petroleum Equipment Suppliers Association

## Non-U.S. Sources of Petroleum Equipment

## By Product Category

BLOWOUT PREVENTERS:

Allstack B.O.P. Services
Blowout Products Ltd.
Breda Fucine
Industrialexportimport
Secure Oil Tool Mfg. Ltd.
Wenlen, SA Estrada

BLOWOUT PREVENTERS - Control Systems:

Allstack B.O.P. Services
Blowout Products Ltd.
Four M Oilfield Equipment
Industrialexportimport
Rogui, SA
Troy Equipment Services Ltd.
Urach
Wagner Industrial & Oilfield Equipment Ltd.
Wenlen, SA Estrada

D-SANDER:

Bolland & Cia
Drexel

D-SILTER:

Bolland & Cia
Drexel

DECANTING CENTRIFUGE:

Alfa Laval
Broadbent
Flottweg
Klockner Humboldt

MUD CLEANER:

Bolland & Cia
Drexel
Thule United, Ltd.

MUD PITS:

Bolland & Cia
Drexel

## Addendum to the Submission of the Petroleum Equipment Suppliers Association

## Non-U.S. Sources of Petroleum Equipment

## By Country of Origin

AUSTRALIA

B & B

AUSTRIA

S.B.S.

BRAZIL

S.K.A.

CANADA

Allstack B.O.P. Services
Four M Oilfield Equipment
Secure Oil Tool Mfg. Ltd.
Troy Equipment Services Ltd.
Wagner Industrial & Oilfield Equipment

DENMARK

Alfa Laval

W. GERMANY

Flottweg
Urach

MEXICO

Roqui

VENEZUELA

Servico Hydrocarb
Suplidora Nacional C.A.
Venezuela Oil Tools
Vivalo